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THE

AMERICAN EPHEMERIS

AND

NAUTICAL ALMANAC

FOR THE YEAR

1890

FIRST EDITION

PUBLISHED IN COMPLIANCE WITH A JOINT RESOLUTION OF THE FORTY-SIXTH CONGRESS

WASHINGTON:
BUREAU OF NAVIGATION.
1887.

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JOINT RESOLUTION

FOR PRINTING THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That there shall be printed annually at the Government Printing Office fifteen hundred copies of the American Ephemeris and Nautical Almanac and of the papers supplementary thereto, of which one hundred shall be for the use of the Senate, four hundred for the House of Representatives, and one thousand for the public service, to be distributed by the Navy Department.

Sec. 2 *That additional copies of the Ephemeris and of the Nautical Almanac extracted therefrom may be ordered by the Secretary of the Navy for sale: Provided, That all moneys received from such sale shall be deposited in the Treasury to the credit of the appropriation for public printing.*

Approved, February 11, 1880

PREFACE.

THE arrangement of *The American Ephemeris* adopted in the volume for the year 1882, and explained in the Appendix to that volume, has been continued without radical change to the present time.

The additions then made comprise more complete data for eclipses of the sun, diagrams showing the configurations of the satellites of Jupiter, data respecting the disks of Mercury and Venus for the reduction of meridian and photometric observations, and diagrams, with tables, for identifying any known satellites of other planets. The work is divided into three parts, as follows:—

Part I, *Ephemeris for the Meridian of Greenwich*, gives the heliocentric and geocentric positions of the major planets, the Ephemeris of the Sun, and other fundamental astronomical data for equidistant intervals of Greenwich mean time.

Part II, *Ephemeris for the Meridian of Washington*, gives the ephemerides of the fixed stars, sun, moon, and major planets for transit over the meridian of Washington. The mean places of the fixed stars and the data for their reduction are also included in this Part. The list of mean and apparent places of fixed stars has been greatly enlarged, for the convenience of field-astronomers.

Part III, *Phenomena*, contains predictions of phenomena to be observed, with data for their computation. Washington mean time is used in this part except in a few cases, notably that of eclipses, where Greenwich mean time was judged more convenient.

SIMON NEWCOMB,
Professor U. S. Navy, Superintendent.

WASHINGTON, *July* 27, 1887.

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CORRECTIONS.

Ephemeris for 1887 (*First Edition only*).

Page 294,	*f* Tauri, in last column,	*for*	12.753	*read*	12.573
296,	Dec. of *α* Hydræ,	“	+	“	—
297,	In all copies of Ephemeris from 1882 to 1887,	“	31 Coronæ Borealis	“	31 Comæ Berenices
298,	*ι* Cassiopeæ, last column,	“	+	“	—
298,	Dec. of *β* Coronæ Borealis,	“	$46''.92$	“	$43''.92$
299,	Groomb. 944, Ann. Var. in R. A.,	“	—	“	+
300,	1 Draconis (H.) in R. A.,	“	$57^s.747$	“	$54^s.747$
511,	16th line from bottom,	“	γ	“	Y
512,	Annapolis mean time of Emersion,	“	5^h	“	6^h

The American Nautical Almanac for 1888 (*First Edition*).

Page 248,	Ann. Var. in Dec. of *δ* Orionis,	*for*	$-2'.93$	*read*	$+2''.93$

Ephemeris for 1888 (*First Edition*).

Page 293,	R. A. of 6 Ursæ Minoris,	*for*	$20^s.008$	*read*	$20^s.080$
294,	47 Cephei (H.) Ann. Var. in R. A.,	“	$+7^s.5152$	“	$+7^s.7152$
297,	*β* Chamæleontis, “ “	“	$+3^s.3706$	“	$+3^s.3996$
297,	*α* Canum Venat., “ “			“	$+2^s.8157$
298,	4 Ursæ Minoris, “ “	“	$-0^s.3349$	“	$-0^s.3249$
298,	*ρ* Bootis, Ann. Var. in Dec.,	“	$-15''.695$	“	$-15''.965$
299,	*δ* Ursæ Minoris, Dec.,	“	$20''.24$	“	$40''.24$
300,	*θ* Lyræ, R. A.,	“	$30^s.791$	“	$28^s.791$
302 to 312,	To the R. A. of *α* Ursæ Minoris apply the correction $-0^s.04$				
322,	Dec. of 11 Orionis,	*for*	South	*read*	North.

CHRONOLOGICAL ERAS AND CYCLES.

CHRONOLOGICAL ERAS.

THE YEAR 1890, WHICH COMPRISES THE LATTER PART OF THE 114TH AND THE BEGINNING OF THE 115TH YEAR OF THE INDEPENDENCE OF THE UNITED STATES OF AMERICA, CORRESPONDS TO—

The year 6603 of the Julian Period;
" 7398–99 of the Byzantine era, the year 7399 commencing on September 1st;
" 5650–51 of the Jewish era, the year 5651 commencing on September 15th, or, more exactly, at sunset on September 14th;
" 2643 since the foundation of Rome, according to Varro;
" 2637 since the beginning of the era of Nabonassar, which has been assigned to Wednesday, the 26th of February of the 3967th year of the Julian Period: corresponding, in the notation of chronologists, to the 747th; and, in the notation of astronomers, to the 746th year before the birth of Christ;
" 2666 of the Olympiads, or the second year of the 667th Olympiad commencing in July, 1890, if we fix the era of the Olympiads at 775½ years before Christ, or near the beginning of July of the year 3938 of the Julian Period;
" 2202 of the Grecian era, or the era of the Seleucidæ;
" 1606 of the era of Diocletian;
" 2550 of the Japanese era and to the 23d year of the period entitled "Meiji."

The year 1308 of the Mohammedan era, or the era of the Hegira, begins on the 17th day of August, 1890.

The first day of January of the year 1890 is the 2,411,369th day since the commencement of the Julian Period.

CHRONOLOGICAL CYCLES.

Dominical Letter	E	Solar Cycle	23
Epact	9	Roman Indiction	3
Lunar Cycle or Golden Number	10	Julian Period	6603

SYMBOLS AND ABBREVIATIONS.

SIGNS OF THE PLANETS, ETC.

☉	The Sun.	♂	Mars.
☾	The Moon.	♃	Jupiter.
☿	Mercury.	♄	Saturn.
♀	Venus.	♅	Uranus.
⊕	The Earth.	♆	Neptune.

SIGNS OF THE ZODIAC.

Spring Signs.	1.	♈	Aries.	Autumn Signs.	7.	♎	Libra.
	2.	♉	Taurus.		8.	♏	Scorpius.
	3.	♊	Gemini.		9.	♐	Sagittarius.
Summer Signs.	4.	♋	Cancer.	Winter Signs.	10.	♑	Capricornus.
	5.	♌	Leo.		11.	♒	Aquarius.
	6.	♍	Virgo.		12.	♓	Pisces.

ASPECTS.

☌	Conjunction, or having the same Longitude or Right Ascension.
□	Quadrature, or differing 90° in Longitude or Right Ascension.
☍	Opposition, or differing 180° in Longitude or Right Ascension.

ABBREVIATIONS.

☊	Ascending Node.	°	Degrees.
☋	Descending Node.	′	Minutes of Arc.
N .	North.	″	Seconds of Arc.
S .	South.	^{h}	Hours.
E .	East.	^{m}	Minutes of Time.
W.	West.	^{s}	Seconds of Time.

PART I.

ASTRONOMICAL EPHEMERIS

FOR THE

MERIDIAN OF GREENWICH.

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Wed.	1	18 48 15.72	11.037	S. 22 59 22.8	+12.74	16 18.43	71.08	3 53.92	1.177
Thur.	2	18 52 40.42	11.021	22 54 3.6	13.88	16 18.43	71.03	4 21.98	1.162
Frid.	3	18 57 4.74	11.004	22 48 17.1	15.00	16 18.43	70.98	4 49.67	1.145
Sat.	4	19 1 28.66	10.987	22 42 3.4	+16.13	16 18.42	70.92	5 16.95	1.128
SUN.	5	19 5 52.15	10.968	22 35 22.8	17.25	16 18.40	70.86	5 43.80	1.109
Mon.	6	19 10 15.18	10.949	22 28 15.3	18.36	16 18.38	70.80	6 10.20	1.090
Tues.	7	19 14 37.73	10.929	22 20 41.3	+19.46	16 18.35	70.73	6 36.12	1.070
Wed.	8	19 18 59.77	10.908	22 12 40.9	20.55	16 18.31	70.66	7 1.54	1.049
Thur.	9	19 23 21.30	10.886	22 4 14.4	21.63	16 18.27	70.59	7 26.44	1.027
Frid.	10	19 27 42.28	10.863	21 55 22.0	+22.71	16 18.22	70.51	7 50.80	1.004
Sat.	11	19 32 2.70	10.839	21 46 4.0	23.78	16 18.17	70.43	8 14.60	0.980
SUN.	12	19 36 22.54	10.814	21 36 20.6	24.83	16 18.11	70.35	8 37.82	0.955
Mon.	13	19 40 41.76	10.789	21 26 12.2	+25.87	16 18.05	70.27	9 0.42	0.930
Tues.	14	19 45 0.36	10.762	21 15 39.0	26.90	16 17.98	70.18	9 22.40	0.903
Wed.	15	19 49 18.32	10.735	21 4 41.2	27.91	16 17.90	70.09	9 43.75	0.876
Thur.	16	19 53 35.62	10.707	20 53 19.0	+28.91	16 17.82	69.99	10 4.43	0.848
Frid.	17	19 57 52.22	10.678	20 41 33.0	29.90	16 17.74	69.89	10 24.43	0.819
Sat.	18	20 2 8.12	10.648	20 29 23.5	30.88	16 17.65	69.79	10 43.72	0.790
SUN.	19	20 6 23.30	10.618	20 16 50.7	+31.84	16 17.56	69.69	11 2.29	0.760
Mon.	20	20 10 37 74	10.587	20 3 55.0	32.79	16 17.46	69.58	11 20.12	0.729
Tues.	21	20 14 51.42	10.555	19 50 36.8	33.72	16 17.36	69.48	11 37.20	0.697
Wed.	22	20 19 4.33	10.523	19 36 56.5	+34.64	16 17.26	69.37	11 53.51	0.665
Thur.	23	20 23 16.45	10 490	19 22 54.3	35.54	16 17.16	69.26	12 9.03	0.632
Frid.	24	20 27 27.77	10.456	19 8 30.6	36.42	16 17.05	69.15	12 23.75	0.598
Sat.	25	20 31 38.27	10.421	18 53 45.9	+37.29	16 16.94	69.04	12 37.66	0.564
SUN.	26	20 35 47.95	10.386	18 38 40.6	38.14	16 16.82	68.93	12 50.75	0.529
Mon.	27	20 39 56.80	10.351	18 23 15.0	38.98	16 16.70	68.82	13 3.01	0.494
Tues.	28	20 44 4.82	10.316	18 7 29.5	+39.80	16 16.58	68.70	13 14.43	0.459
Wed.	29	20 48 11.99	10.281	17 51 24.6	40.60	16 16.45	68.59	13 25.02	0.424
Thur.	30	20 52 18.32	10.246	17 35 0.7	41.39	16 16.32	68.47	13 34.77	0.389
Frid.	31	20 56 23.81	10.211	17 18 18.1	42.16	16 16.18	68.36	13 43.68	0.354
Sat.	32	21 0 28.45	10.176	S. 17 1 17.3	+42.91	16 16.04	68.24	13 51.75	0.319

Note.—The mean time of semidiameter passing may be found by subtracting 0s.19 from the sidereal time.

The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Wed.	1	18 48 15.01	11.033	S. 22 59 23.6	+12.74	3 53.84	1.177	18 44 21.16
Thur.	2	18 52 39.62	11.018	22 54 4.6	13.87	4 21.90	1.162	18 48 17.72
Frid.	3	18 57 3.86	11.001	22 48 18.3	14.99	4 49.58	1.145	18 52 14.28
Sat.	4	19 1 27.70	10.984	22 42 4.8	+16.12	5 16.86	1.128	18 56 10.84
SUN.	5	19 5 51.10	10.965	22 35 24.4	17.24	5 43.70	1.109	19 0 7.40
Mon.	6	19 10 14.05	10.946	22 28 17.2	18.35	6 10.09	1.090	19 4 3.96
Tues.	7	19 14 36.52	10.926	22 20 43.4	+19.45	6 36.01	1.070	19 8 0.51
Wed.	8	19 18 58.49	10.905	22 12 43.3	20.54	7 1.42	1.049	19 11 57.07
Thur.	9	19 23 19.95	10.883	22 4 17.1	21.62	7 26.32	1.027	19 15 53.63
Frid.	10	19 27 40.86	10.860	21 55 25.0	+22.70	7 50.68	1.004	19 19 50.19
Sat.	11	19 32 1.21	10.836	21 46 7.3	23.77	8 14.47	0.980	19 23 46.74
SUN.	12	19 36 20.98	10.811	21 36 24.2	24.82	8 37.68	0.955	19 27 43.30
Mon.	13	19 40 40.14	10.786	21 26 16.1	+25.86	9 0.28	0.930	19 31 39.86
Tues.	14	19 44 58.68	10.759	21 15 43.2	26.89	9 22.26	0.903	19 35 36.42
Wed.	15	19 49 16.58	10.732	21 4 45.6	27.90	9 43.61	0.876	19 39 32.97
Thur.	16	19 53 33.82	10.704	20 53 23.8	+28.90	10 4.29	0.848	19 43 29.53
Frid.	17	19 57 50.37	10.675	20 41 38.2	29.89	10 24.29	0.819	19 47 26.08
Sat.	18	20 2 6.22	10.646	20 29 29.0	30.87	10 43.58	0.790	19 51 22.64
SUN.	19	20 6 21.35	10.616	20 16 56.6	+31.83	11 2.15	0.760	19 55 19.20
Mon.	20	20 10 35.74	10.585	20 4 1.2	32.78	11 19.98	0.729	19 59 15.76
Tues.	21	20 14 49.38	10.553	19 50 43.3	33.71	11 37.07	0.697	20 3 12.31
Wed.	22	20 19 2.25	10.521	19 37 3.3	+34.63	11 53.38	0.665	20 7 8.87
Thur.	23	20 23 14.33	10.488	19 23 1.4	35.53	12 8.90	0.632	20 11 5.43
Frid.	24	20 27 25.61	10.454	19 8 38.1	36.41	12 23.63	0.598	20 15 1.99
Sat.	25	20 31 36.08	10.420	18 53 53.7	+37.28	12 37.55	0.564	20 18 58.54
SUN.	26	20 35 45.73	10.385	18 38 48.7	38.13	12 50.64	0.529	20 22 55.10
Mon.	27	20 39 54.55	10.350	18 23 23.4	38.97	13 2.90	0.494	20 26 51.65
Tues.	28	20 44 2.54	10.315	18 7 38.2	+39.79	13 14.33	0.459	20 30 48.21
Wed.	29	20 48 9.69	10.280	17 51 33.6	40.59	13 24.93	0.424	20 34 44.76
Thur.	30	20 52 16.00	10.245	17 35 10.0	41.38	13 34.69	0.389	20 38 41.32
Frid.	31	20 56 21.47	10.210	17 18 27.7	42.15	13 43.60	0.354	20 42 37.87
Sat.	32	21 0 26.10	10.175	S. 17 1 27.2	+42.90	13 51.67	0.319	20 46 34.43

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

Diff. for 1 Hour,
$+9^{s}.8565$.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S							Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.		
		λ	λ′						
		° ′ ″	′ ″	″	″				h m s
1	1	281 5 51.1	6 7.8	152.88	− 0.35	9.9926458	− 0.9		5 14 47.13
2	2	282 7 0.2	7 16.7	152.87	0.24	9.9926451	+ 0.2		5 10 51.22
3	3	283 8 9.0	8 25.3	152.86	− 0.12	9.9926470	1.3		5 6 55.31
4	4	284 9 17.5	9 33.7	152.85	+ 0.01	9.9926516	+ 2.5		5 2 59.40
5	5	285 10 25.9	10 41.9	152.84	0.15	9.9926590	3.7		4 59 3.49
6	6	286 11 34.1	11 49.9	152.83	0.28	9.9926693	4.9		4 55 7.57
7	7	287 12 42.1	12 57.7	152.83	+ 0.40	9.9926824	+ 6.1		4 51 11.66
8	8	288 13 49.9	14 5.3	152.82	0.51	9.9926984	7.2		4 47 15.74
9	9	289 14 57.5	15 12.7	152.82	0.60	9.9927171	8.4		4 43 19.82
10	10	290 16 5.0	16 20.1	152.81	+ 0.67	9.9927385	+ 9.5		4 39 23.91
11	11	291 17 12.5	17 27.4	152.81	0.70	9.9927626	10.6		4 35 28.00
12	12	292 18 19.8	18 34.5	152.80	0.71	9.9927892	11.6		4 31 32.09
13	13	293 19 27.0	19 41.5	152.80	+ 0.68	9.9928182	+12.6		4 27 36.18
14	14	294 20 34.0	20 48.4	152.79	0.63	9.9928494	13.5		4 23 40.27
15	15	295 21 40.8	21 55.1	152.78	0.55	9.9928827	14.3		4 19 44.36
16	16	296 22 47.4	23 1.5	152.77	+ 0.44	9.9929179	+15.1		4 15 48.45
17	17	297 23 53.7	24 7.6	152.75	0.32	9.9929549	15.8		4 11 52.53
18	18	298 24 59.5	25 13.3	152.73	0.20	9.9929937	16.5		4 7 56.62
19	19	299 26 4.7	26 18.4	152.71	+ 0.07	9.9930342	+17.2		4 4 0.71
20	20	300 27 9.4	27 22.9	152.68	− 0.06	9.9930762	17.8		4 0 4.80
21	21	301 28 13.4	28 26.7	152.65	0.18	9.9931197	18.5		3 56 8.90
22	22	302 29 16.7	29 29.8	152.62	− 0.27	9.9931647	+19.1		3 52 12.99
23	23	303 30 19.2	30 32.1	152.58	0.34	9.9932113	19.7		3 48 17.08
24	24	304 31 20.7	31 33.4	152.54	0.39	9.9932595	20.4		3 44 21.16
25	25	305 32 21.0	32 33.6	152.49	− 0.41	9.9933093	+21.1		3 40 25.25
26	26	306 33 20.1	33 32.6	152.44	0.39	9.9933607	21.8		3 36 29.34
27	27	307 34 18.1	34 30.4	152.39	0.34	9.9934139	22.6		3 32 33.43
28	28	308 35 14.9	35 27.1	152.33	− 0.27	9.9934690	+23.4		3 28 37.52
29	29	309 36 10.4	36 22.5	152.28	0.18	9.9935261	24.2		3 24 41.61
30	30	310 37 4.5	37 16.5	152.22	− 0.06	9.9935853	25.1		3 20 45.70
31	31	311 37 57.3	38 9.1	152.17	+ 0.07	9.9936467	26.0		3 16 49.79
32	32	312 38 48.8	39 0.4	152.12	+ 0.21	9.9937105	+27.0		3 12 53.88

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January 0ᵈ.0.

Diff. for 1 Hour,
— 9ˢ.8296.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 2.1	14 58.4	55 3.9	−1.20	54 50.4	−1.05	8 43.4	1.90	10.0
2	14 55.3	14 52.5	54 38.7	0.91	54 28.5	0.79	9 29.6	1.96	11.0
3	14 50.1	14 48.2	54 19.9	0.66	54 12.8	0.54	10 17.2	2.01	12.0
4	14 46.6	14 45.5	54 7.1	−0.42	54 2.7	−0.31	11 5.9	2.04	13.0
5	14 44.6	14 44.1	53 59.6	−0.21	53 57.8	−0.10	11 55.3	2.06	14.0
6	14 44.0	14 44.1	53 57.2	0.00	53 57.8	+0.11	12 44.6	2.03	15.0
7	14 44.7	14 45.5	53 59.8	+0.22	54 3.0	+0.33	13 32.9	1.98	16.0
8	14 46.8	14 48.5	54 7.7	0.45	54 13.8	0.57	14 19.8	1.92	17.0
9	14 50.6	14 53.1	54 21.4	0.70	54 30.6	0.84	15 5.1	1.84	18.0
10	14 56.0	14 59.4	54 41.6	+0.99	54 54.3	+1.13	15 49.2	1.80	19.0
11	15 3.4	15 7.9	55 8.8	1.29	55 25.3	1.45	16 32.6	1.82	20.0
12	15 13.0	15 18.5	55 43.6	1.61	56 3.8	1.76	17 16.1	1.86	21.0
13	15 24.5	15 30.9	56 25.9	+1.91	56 49.6	+2.04	18 0.8	1.93	22.0
14	15 37.7	15 44.9	57 14.8	2.15	57 41.2	2.24	18 47.9	2.03	23.0
15	15 52.4	16 0.0	58 8.5	2.30	58 36.3	2.31	19 38.5	2.20	24.0
16	16 7.5	16 14.8	59 4.0	+2.28	59 31.0	+2.20	20 33.6	2.39	25.0
17	16 21.8	16 28.3	59 56.7	2.06	60 20.4	1.86	21 33.4	2.57	26.0
18	16 34.0	16 38.7	60 41.3	1.60	60 58.7	1.28	22 37.2	2.69	27.0
19	16 42.3	16 44.7	61 12.0	+0.92	61 20.8	+0.52	23 42.5	2.69	28.0
20	16 45.7	16 45.4	61 24.5	+0.10	61 23.1	−0.33	δ		29.0
21	16 43.6	16 40.5	61 16.6	−0.75	61 5.2	1.14	0 46.6	2.59	0.5
22	16 36.1	16 30.7	60 49.2	−1.50	60 29.2	−1.81	1 47.1	2.43	1.5
23	16 24.3	16 17.3	60 5.9	2.05	59 40.0	2.24	2 43.1	2.27	2.5
24	16 9.7	16 1.9	59 12.3	2.36	58 43.4	2.43	3 34.9	2.09	3.5
25	15 53.9	15 46.0	58 14.0	−2.44	57 44.9	−2.40	4 23.4	1.96	4.5
26	15 38.2	15 30.8	57 16.5	2.32	56 49.2	2.21	5 9.8	1.91	5.5
27	15 23.8	15 17.3	56 23.5	2.06	55 59.7	1.91	5 55.3	1.89	6.5
28	15 11.3	15 6.0	55 37.8	−1.73	55 18.2	−1.55	6 40.6	1.90	7.5
29	15 1.2	14 57.1	55 0.7	1.36	54 45.6	1.17	7 26.7	1.94	8.5
30	14 53.6	14 50.7	54 32.7	0.98	54 22.1	0.80	8 13.9	1.99	9.5
31	14 48.4	14 46.7	54 13.6	0.62	54 7.2	0.45	9 2.2	2.03	10.5
32	14 45.5	14 44.7	54 2.7	−0.30	54 0.0	−0.15	9 51.3	2.05	11.5

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	3 11 50.34	1.9860	N.14 3 28.7	10.133
1	3 13 49.55	1.9877	14 13 34.7	10.065
2	3 15 48.86	1.9894	14 23 36.5	9.996
3	3 17 48.27	1.9911	14 33 34.2	9.927
4	3 19 47.79	1.9929	14 43 27.7	9.857
5	3 21 47.42	1.9947	14 53 17.0	9.787
6	3 23 47.16	1.9966	15 3 2.1	9.717
7	3 25 47.01	1.9984	15 12 43.0	9.645
8	3 27 46.97	2.0003	15 22 19.5	9.572
9	3 29 47.05	2.0022	15 31 51.7	9.500
10	3 31 47.24	2.0042	15 41 19.5	9.427
11	3 33 47.55	2.0062	15 50 42.9	9.352
12	3 35 47.98	2.0082	16 0 1.8	9.277
13	3 37 48.53	2.0102	16 9 16.2	9.202
14	3 39 49.20	2.0122	16 18 26.1	9.127
15	3 41 50.00	2.0143	16 27 31.4	9.050
16	3 43 50.92	2.0164	16 36 32.1	8.972
17	3 45 51.97	2.0186	16 45 28.1	8.894
18	3 47 53.15	2.0207	16 54 19.4	8.816
19	3 49 54.46	2.0228	17 3 6.0	8.737
20	3 51 55.89	2.0249	17 11 47.8	8.657
21	3 53 57.45	2.0271	17 20 24.8	8.577
22	3 55 59.14	2.0293	17 28 57.0	8.496
23	3 58 0.96	2.0314	N.17 37 24.3	8.414

THURSDAY 2.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	4 0 2.91	2.0336	N.17 45 46.6	8.331
1	4 2 5.00	2.0359	17 54 4.0	8.248
2	4 4 7.22	2.0381	18 2 16.4	8.165
3	4 6 9.57	2.0403	18 10 23.8	8.081
4	4 8 12.06	2.0426	18 18 26.1	7.996
5	4 10 14.68	2.0448	18 26 23.3	7.911
6	4 12 17.44	2.0471	18 34 15.4	7.825
7	4 14 20.33	2.0493	18 42 2.3	7.739
8	4 16 23.36	2.0516	18 49 44.0	7.652
9	4 18 26.53	2.0539	18 57 20.5	7.564
10	4 20 29.83	2.0561	19 4 51.7	7.476
11	4 22 33.26	2.0583	19 12 17.6	7.387
12	4 24 36.83	2.0606	19 19 38.1	7.297
13	4 26 40.54	2.0629	19 26 53.2	7.207
14	4 28 44.38	2.0652	19 34 2.9	7.117
15	4 30 48.36	2.0675	19 41 7.2	7.026
16	4 32 52.48	2.0697	19 48 6.0	6.934
17	4 34 56.73	2.0719	19 54 59.3	6.841
18	4 37 1.11	2.0742	20 1 47.0	6.748
19	4 39 5.63	2.0764	20 8 29.1	6.655
20	4 41 10.28	2.0786	20 15 5.6	6.562
21	4 43 15.06	2.0808	20 21 36.5	6.467
22	4 45 19.98	2.0831	20 28 1.7	6.372
23	4 47 25.03	2.0853	20 34 21.2	6.277
24	4 49 30.21	2.0874	N.20 40 34.9	6.181

FRIDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	4 49 30.21	2.0874	N.20 40 34.9	6.181
1	4 51 35.52	2.0896	20 46 42.9	6.085
2	4 53 40.96	2.0917	20 52 45.1	5.987
3	4 55 46.53	2.0938	20 58 41.4	5.889
4	4 57 52.22	2.0959	21 4 31.8	5.791
5	4 59 58.04	2.0980	21 10 16.3	5.692
6	5 2 3.98	2.1000	21 15 54.9	5.594
7	5 4 10.04	2.1021	21 21 27.6	5.495
8	5 6 16.23	2.1042	21 26 54.3	5.395
9	5 8 22.54	2.1062	21 32 15.0	5.294
10	5 10 28.97	2.1081	21 37 29.6	5.192
11	5 12 35.51	2.1100	21 42 38.1	5.091
12	5 14 42.17	2.1119	21 47 40.5	4.989
13	5 16 48.94	2.1138	21 52 36.8	4.887
14	5 18 55.83	2.1157	21 57 27.0	4.785
15	5 21 2.83	2.1176	22 2 11.0	4.682
16	5 23 9.94	2.1194	22 6 48.8	4.578
17	5 25 17.15	2.1211	22 11 20.4	4.475
18	5 27 24.47	2.1228	22 15 45.8	4.371
19	5 29 31.89	2.1245	22 20 4.9	4.266
20	5 31 39.41	2.1262	22 24 17.7	4.160
21	5 33 47.04	2.1279	22 28 24.1	4.054
22	5 35 54.76	2.1295	22 32 24.2	3.948
23	5 38 2.58	2.1311	N.22 36 17.9	3.842

SATURDAY 4.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	5 40 10.49	2.1326	N.22 40 5.3	3.736
1	5 42 18.49	2.1341	22 43 46.3	3.629
2	5 44 26.58	2.1355	22 47 20.8	3.522
3	5 46 34.75	2.1369	22 50 48.9	3.414
4	5 48 43.01	2.1383	22 54 10.5	3.307
5	5 50 51.35	2.1396	22 57 25.7	3.199
6	5 52 59.76	2.1409	23 0 34.4	3.091
7	5 55 8.25	2.1421	23 3 36.6	2.982
8	5 57 16.81	2.1432	23 6 32.2	2.872
9	5 59 25.44	2.1444	23 9 21.3	2.763
10	6 1 34.14	2.1455	23 12 3.8	2.653
11	6 3 42.90	2.1466	23 14 39.7	2.544
12	6 5 51.73	2.1477	23 17 9.1	2.435
13	6 8 0.62	2.1486	23 19 31.9	2.324
14	6 10 9.56	2.1495	23 21 48.0	2.213
15	6 12 18.56	2.1504	23 23 57.5	2.103
16	6 14 27.61	2.1512	23 26 0.4	1.992
17	6 16 36.70	2.1519	23 27 56.6	1.881
18	6 18 45.83	2.1526	23 29 46.1	1.770
19	6 20 55.01	2.1533	23 31 29.0	1.659
20	6 23 4.23	2.1539	23 33 5.2	1.547
21	6 25 13.48	2.1544	23 34 34.7	1.436
22	6 27 22.76	2.1550	23 35 57.5	1.324
23	6 29 32.08	2.1556	23 37 13.6	1.213
24	6 31 41.43	2.1560	N.23 38 23.0	1.101

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 5.					**TUESDAY 7.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	6 31 41.43	2.1560	N.23 38 23.0	1.101	0	8 14 39.25	2.1154	N.22 23 2.8	4.172
1	6 33 50.80	2.1563	23 39 25.7	0.988	1	8 16 46.12	2.1135	22 18 49.4	4.275
2	6 36 0.18	2.1565	23 40 21.6	0.876	2	8 18 52.87	2.1115	22 14 29.8	4.378
3	6 38 9.58	2.1568	23 41 10.8	0.764	3	8 20 59.50	2.1095	22 10 4.0	4.481
4	6 40 19.00	2.1571	23 41 53.3	0.652	4	8 23 6.01	2.1074	22 5 32.1	4.583
5	6 42 28.43	2.1572	23 42 29.1	0.540	5	8 25 12.39	2.1053	22 0 54.1	4.684
6	6 44 37.86	2.1573	23 42 58.1	0.427	6	8 27 18.65	2.1032	21 56 10.0	4.786
7	6 46 47.30	2.1573	23 43 20.4	0.315	7	8 29 24.78	2.1011	21 51 19.8	4.887
8	6 48 56.74	2.1573	23 43 35.9	0.203	8	8 31 30.78	2.0990	21 46 23.6	4.987
9	6 51 6.17	2.1572	23 43 44.7	+ 0.091	9	8 33 36.66	2.0968	21 41 21.4	5.087
10	6 53 15.60	2.1571	23 43 46.8	− 0.022	10	8 35 42.40	2.0946	21 36 13.2	5.186
11	6 55 25.02	2.1569	23 43 42.1	0.134	11	8 37 48.01	2.0923	21 30 59.1	5.285
12	6 57 34.43	2.1567	23 43 30.7	0.246	12	8 39 53.48	2.0901	21 25 39.0	5.384
13	6 59 43.82	2.1564	23 43 12.6	0.359	13	8 41 58.82	2.0878	21 20 13.0	5.481
14	7 1 53.19	2.1561	23 42 47.7	0.471	14	8 44 4.02	2.0855	21 14 41.2	5.578
15	7 4 2.55	2.1557	23 42 16.1	0.582	15	8 46 9.08	2.0832	21 9 3.6	5.675
16	7 6 11.88	2.1552	23 41 37.8	0.694	16	8 48 14.00	2.0808	21 3 20.2	5.772
17	7 8 21.18	2.1547	23 40 52.8	0.807	17	8 50 18.78	2.0785	20 57 31.0	5.867
18	7 10 30.45	2.1542	23 40 1.0	0.919	18	8 52 23.42	2.0761	20 51 36.1	5.962
19	7 12 39.68	2.1536	23 39 2.5	1.031	19	8 54 27.91	2.0737	20 45 35.5	6.057
20	7 14 48.88	2.1530	23 37 57.3	1.142	20	8 56 32.26	2.0713	20 39 29.2	6.152
21	7 16 58.04	2.1523	23 36 45.5	1.253	21	8 58 36.47	2.0689	20 33 17.2	6.246
22	7 19 7.15	2.1515	23 35 27.0	1.364	22	9 0 40.53	2.0665	20 26 59.7	6.339
23	7 21 16.22	2.1507	N.23 34 1.8	1.476	23	9 2 44.45	2.0641	N.20 20 36.6	6.432
	MONDAY 6.					**WEDNESDAY 8.**			
0	7 23 25.24	2.1499	N.23 32 29.9	1.587	0	9 4 48.22	2.0616	N.20 14 7.9	6.524
1	7 25 34.21	2.1490	23 30 51.4	1.697	1	9 6 51.84	2.0591	20 7 33.7	6.615
2	7 27 43.12	2.1480	23 29 6.2	1.808	2	9 8 55.31	2.0566	20 0 54.1	6.706
3	7 29 51.97	2.1470	23 27 14.4	1.918	3	9 10 58.63	2.0541	19 54 9.0	6.797
4	7 32 0.76	2.1459	23 25 16.0	2.028	4	9 13 1.80	2.0516	19 47 18.5	6.886
5	7 34 9.48	2.1448	23 23 11.0	2.138	5	9 15 4.82	2.0492	19 40 22.7	6.974
6	7 36 18.13	2.1436	23 20 59.4	2.248	6	9 17 7.70	2.0467	19 33 21.6	7.063
7	7 38 26.71	2.1424	23 18 41.2	2.358	7	9 19 10.42	2.0441	19 26 15.2	7.151
8	7 40 35.22	2.1412	23 16 16.4	2.467	8	9 21 12.99	2.0416	19 19 3.5	7.238
9	7 42 43.66	2.1400	23 13 45.1	2.576	9	9 23 15.41	2.0391	19 11 46.6	7.325
10	7 44 52.02	2.1386	23 11 7.3	2.684	10	9 25 17.68	2.0366	19 4 24.5	7.412
11	7 47 0.29	2.1372	23 8 23.0	2.792	11	9 27 19.80	2.0341	18 56 57.2	7.498
12	7 49 8.48	2.1358	23 5 32.2	2.901	12	9 29 21.77	2.0316	18 49 24.7	7.583
13	7 51 16.59	2.1343	23 2 34.9	3.009	13	9 31 23.59	2.0291	18 41 47.2	7.667
14	7 53 24.60	2.1327	22 59 31.1	3.116	14	9 33 25.26	2.0265	18 34 4.7	7.750
15	7 55 32.52	2.1312	22 56 20.9	3.223	15	9 35 26.77	2.0240	18 26 17.2	7.833
16	7 57 40.34	2.1296	22 53 4.3	3.330	16	9 37 28.14	2.0216	18 18 24.7	7.916
17	7 59 48.07	2.1280	22 49 41.3	3.437	17	9 39 29.36	2.0191	18 10 27.3	7.998
18	8 1 55.70	2.1263	22 46 11.9	3.543	18	9 41 30.43	2.0166	18 2 25.0	8.079
19	8 4 3.22	2.1245	22 42 36.2	3.648	19	9 43 31.35	2.0141	17 54 17.8	8.160
20	8 6 10.64	2.1228	22 38 54.1	3.753	20	9 45 32.12	2.0117	17 46 5.8	8.240
21	8 8 17.96	2.1211	22 35 5.7	3.859	21	9 47 32.75	2.0092	17 37 49.0	8.319
22	8 10 25.17	2.1192	22 31 11.0	3.964	22	9 49 33.23	2.0067	17 29 27.5	8.398
23	8 12 32.27	2.1173	22 27 10.0	4.068	23	9 51 33.56	2.0043	17 21 1.3	8.476
24	8 14 39.25	2.1154	N.22 23 2.8	4.172	24	9 53 33.75	2.0019	N.17 12 30.4	8.553

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	9 53 33.75	2.0019	N.17 12 30.4	8.553
1	9 55 33.79	1.9995	17 3 54.9	8.630
2	9 57 33.69	1.9972	16 55 14.8	8.707
3	9 59 33.45	1.9948	16 46 30.1	8.782
4	10 1 33.07	1.9925	16 37 40.9	8.857
5	10 3 32.55	1.9902	16 28 47.3	8.931
6	10 5 31.89	1.9878	16 19 49.2	9.005
7	10 7 31.09	1.9855	16 10 46.7	9.078
8	10 9 30.15	1.9833	16 1 39.9	9.150
9	10 11 29.08	1.9811	15 52 28.7	9.222
10	10 13 27.88	1.9788	15 43 13.2	9.293
11	10 15 26.54	1.9766	15 33 53.5	9.363
12	10 17 25.07	1.9744	15 24 29.6	9.432
13	10 19 23.47	1.9723	15 15 1.6	9.502
14	10 21 21.74	1.9702	15 5 29.4	9.571
15	10 23 19.89	1.9682	14 55 53.1	9.639
16	10 25 17.92	1.9661	14 46 12.7	9.707
17	10 27 15.82	1.9640	14 36 28.3	9.773
18	10 29 13.60	1.9620	14 26 40.0	9.838
19	10 31 11.26	1.9600	14 16 47.8	9.903
20	10 33 8.80	1.9581	14 6 51.7	9.968
21	10 35 6.23	1.9562	13 56 51.7	10.033
22	10 37 3.54	1.9543	13 46 47.8	10.096
23	10 39 0.74	1.9525	N.13 36 40.2	10.158

FRIDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	10 40 57.84	1.9507	N.13 26 28.9	10.219
1	10 42 54.83	1.9489	13 16 13.9	10.281
2	10 44 51.71	1.9472	13 5 55.2	10.342
3	10 46 48.49	1.9455	12 55 32.9	10.401
4	10 48 45.17	1.9438	12 45 7.1	10.460
5	10 50 41.75	1.9422	12 34 37.7	10.519
6	10 52 38.24	1.9407	12 24 4.8	10.577
7	10 54 34.64	1.9392	12 13 28.5	10.634
8	10 56 30.94	1.9376	12 2 48.7	10.691
9	10 58 27.15	1.9362	11 52 5.5	10.747
10	11 0 23.28	1.9347	11 41 19.0	10.802
11	11 2 19.32	1.9333	11 30 29.2	10.857
12	11 4 15.28	1.9320	11 19 36.1	10.912
13	11 6 11.16	1.9308	11 8 39.8	10.965
14	11 8 6.97	1.9296	10 57 40.3	11.017
15	11 10 2.71	1.9284	10 46 37.7	11.069
16	11 11 58.38	1.9273	10 35 32.0	11.121
17	11 13 53.98	1.9262	10 24 23.2	11.172
18	11 15 49.52	1.9252	10 13 11.4	11.222
19	11 17 45.00	1.9242	10 1 56.6	11.271
20	11 19 40.42	1.9232	9 50 38.9	11.319
21	11 21 35.78	1.9222	9 39 18.3	11.367
22	11 23 31.09	1.9214	9 27 54.8	11.415
23	11 25 26.35	1.9207	9 16 28.5	11.462
24	11 27 21.57	1.9200	N. 9 4 59.4	11.508

SATURDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	11 27 21.57	1.9200	N. 9 4 59.4	11.508
1	11 29 16.75	1.9192	8 53 27.5	11.553
2	11 31 11.88	1.9185	8 41 53.0	11.598
3	11 33 6.97	1.9179	8 30 15.8	11.642
4	11 35 2.03	1.9175	8 18 36.0	11.685
5	11 36 57.07	1.9171	8 6 53.6	11.728
6	11 38 52.08	1.9166	7 55 8.6	11.771
7	11 40 47.06	1.9162	7 43 21.1	11.812
8	11 42 42.02	1.9159	7 31 31.2	11.853
9	11 44 36.97	1.9156	7 19 38.8	11.893
10	11 46 31.90	1.9154	7 7 44.0	11.932
11	11 48 26.82	1.9153	6 55 46.9	11.970
12	11 50 21.74	1.9152	6 43 47.6	12.007
13	11 52 16.65	1.9152	6 31 46.0	12.045
14	11 54 11.56	1.9153	6 19 42.2	12.083
15	11 56 6.48	1.9154	6 7 36.1	12.119
16	11 58 1.41	1.9156	5 55 27.9	12.154
17	11 59 56.35	1.9158	5 43 17.7	12.188
18	12 1 51.30	1.9160	5 31 5.4	12.221
19	12 3 46.27	1.9164	5 18 51.1	12.254
20	12 5 41.27	1.9168	5 6 34.9	12.287
21	12 7 36.29	1.9172	4 54 16.7	12.319
22	12 9 31.34	1.9177	4 41 56.6	12.350
23	12 11 26.42	1.9183	N. 4 29 34.7	12.380

SUNDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	12 13 21.54	1.9190	N. 4 17 11.0	12.410
1	12 15 16.70	1.9197	4 4 45.5	12.439
2	12 17 11.91	1.9205	3 52 18.3	12.467
3	12 19 7.16	1.9213	3 39 49.5	12.494
4	12 21 2.47	1.9223	3 27 19.1	12.520
5	12 22 57.84	1.9233	3 14 47.1	12.546
6	12 24 53.27	1.9244	3 2 13.5	12.572
7	12 26 48.77	1.9255	2 49 38.4	12.597
8	12 28 44.33	1.9266	2 37 1.8	12.621
9	12 30 39.96	1.9278	2 24 23.9	12.643
10	12 32 35.67	1.9292	2 11 44.7	12.664
11	12 34 31.47	1.9307	1 59 4.2	12.686
12	12 36 27.35	1.9321	1 46 22.4	12.707
13	12 38 23.32	1.9336	1 33 39.3	12.727
14	12 40 19.38	1.9352	1 20 55.1	12.746
15	12 42 15.54	1.9369	1 8 9.8	12.764
16	12 44 11.81	1.9387	0 55 23.4	12.782
17	12 46 8.18	1.9404	0 42 35.9	12.800
18	12 48 4.66	1.9422	0 29 47.4	12.817
19	12 50 1.25	1.9442	0 16 57.9	12.832
20	12 51 57.96	1.9463	N. 0 4 7.6	12.845
21	12 53 54.80	1.9484	S. 0 8 43.5	12.858
22	12 55 51.77	1.9506	0 21 35.4	12.871
23	12 57 48.87	1.9528	0 34 28.1	12.884
24	12 59 46.11	1.9551	S. 0 47 21.5	12.896

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 13.					WEDNESDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	12 59 46.11	1.9551	S. 0 47 21.5	12.896	0	14 37 42.38	2.1545	S. 11 1 25.4	12.283
1	13 1 43.49	1.9575	1 0 15.6	12.906	1	14 39 51.83	2.1605	11 13 41.2	12.243
2	13 3 41.01	1.9599	1 13 10.2	12.914	2	14 42 1.64	2.1666	11 25 54.5	12.201
3	13 5 38.68	1.9625	1 26 5.3	12.923	3	14 44 11.82	2.1727	11 38 5.3	12.157
4	13 7 36.51	1.9652	1 39 0.9	12.931	4	14 46 22.37	2.1789	11 50 13.4	12.112
5	13 9 34.50	1.9678	1 51 57.0	12.938	5	14 48 33.29	2.1851	12 2 18.7	12.064
6	13 11 32.65	1.9705	2 4 53.5	12.944	6	14 50 44.58	2.1913	12 14 21.1	12.016
7	13 13 30.96	1.9733	2 17 50.3	12.949	7	14 52 56.25	2.1977	12 26 20.6	11.967
8	13 15 29.45	1.9763	2 30 47.4	12.954	8	14 55 8.31	2.2041	12 38 17.2	11.917
9	13 17 28.12	1.9793	2 43 44.8	12.957	9	14 57 20.75	2.2106	12 50 10.7	11.865
10	13 19 26.97	1.9823	2 56 42.3	12.959	10	14 59 33.58	2.2172	13 2 1.0	11.811
11	13 21 26.00	1.9854	3 9 39.9	12.961	11	15 1 46.81	2.2238	13 13 48.0	11.755
12	13 23 25.22	1.9886	3 22 37.6	12.962	12	15 4 0.44	2.2305	13 25 31.6	11.698
13	13 25 24.63	1.9919	3 35 35.3	12.961	13	15 6 14.47	2.2372	13 37 11.8	11.641
14	13 27 24.25	1.9953	3 48 32.9	12.960	14	15 8 28.90	2.2439	13 48 48.5	11.581
15	13 29 24.07	1.9987	4 1 30.5	12.958	15	15 10 43.74	2.2507	14 0 21.5	11.519
16	13 31 24.10	2.0022	4 14 27.9	12.955	16	15 12 58.99	2.2576	14 11 50.8	11.457
17	13 33 24.34	2.0058	4 27 25.1	12.951	17	15 15 14.66	2.2646	14 23 16.3	11.392
18	13 35 24.80	2.0095	4 40 22.0	12.946	18	15 17 30.74	2.2715	14 34 37.9	11.326
19	13 37 25.48	2.0133	4 53 18.6	12.940	19	15 19 47.24	2.2786	14 45 55.4	11.257
20	13 39 26.39	2.0171	5 6 14.8	12.932	20	15 22 4.17	2.2857	14 57 8.8	11.188
21	13 41 27.53	2.0209	5 19 10.5	12.924	21	15 24 21.52	2.2928	15 8 18.0	11.117
22	13 43 28.90	2.0249	5 32 5.7	12.915	22	15 26 39.30	2.2999	15 19 22.9	11.045
23	13 45 30.52	2.0290	S. 5 45 0.3	12.905	23	15 28 57.51	2.3072	S. 15 30 23.4	10.972
	TUESDAY 14.					THURSDAY 16.			
0	13 47 32.38	2.0331	S. 5 57 54.3	12.894	0	15 31 16.16	2.3144	S. 15 41 19.5	10.897
1	13 49 34.49	2.0373	6 10 47.6	12.882	1	15 33 35.24	2.3217	15 52 11.0	10.819
2	13 51 36.86	2.0416	6 23 40.1	12.868	2	15 35 54.76	2.3290	16 2 57.8	10.739
3	13 53 39.49	2.0460	6 36 31.8	12.854	3	15 38 14.72	2.3363	16 13 39.7	10.658
4	13 55 42.38	2.0504	6 49 22.6	12.839	4	15 40 35.12	2.3437	16 24 16.7	10.576
5	13 57 45.53	2.0548	7 2 12.5	12.822	5	15 42 55.97	2.3512	16 34 48.8	10.492
6	13 59 48.95	2.0594	7 15 1.3	12.804	6	15 45 17.26	2.3586	16 45 15.8	10.407
7	14 1 52.65	2.0641	7 27 49.0	12.786	7	15 47 39.00	2.3661	16 55 37.6	10.319
8	14 3 56.64	2.0688	7 40 35.6	12.767	8	15 49 1.19	2.3736	17 5 54.1	10.229
9	14 6 0.91	2.0736	7 53 21.0	12.746	9	15 52 23.82	2.3810	17 16 5.1	10.137
10	14 8 5.47	2.0785	8 6 5.1	12.723	10	15 54 46.91	2.3886	17 26 10.6	10.045
11	14 10 10.33	2.0835	8 18 47.8	12.699	11	15 57 10.45	2.3961	17 36 10.5	9.951
12	14 12 15.49	2.0885	8 31 29.0	12.674	12	15 59 34.44	2.4037	17 46 4.7	9.855
13	14 14 20.95	2.0936	8 44 8.7	12.649	13	16 1 58.89	2.4112	17 55 53.1	9.757
14	14 16 26.72	2.0988	8 56 46.9	12.623	14	16 4 23.79	2.4188	18 5 35.5	9.657
15	14 18 32.80	2.1040	9 9 23.5	12.595	15	16 6 49.15	2.4264	18 15 11.9	9.555
16	14 20 39.20	2.1094	9 21 58.3	12.565	16	16 9 14.96	2.4340	18 24 42.1	9.452
17	14 22 45.93	2.1148	9 34 31.3	12.534	17	16 11 41.23	2.4416	18 34 6.1	9.347
18	14 24 52.98	2.1202	9 47 2.4	12.502	18	16 14 7.95	2.4492	18 43 23.8	9.241
19	14 27 0.36	2.1258	9 59 31.6	12.469	19	16 16 35.13	2.4567	18 52 35.0	9.132
20	14 29 8.08	2.1315	10 11 58.7	12.434	20	16 19 2.76	2.4642	19 1 39.6	9.021
21	14 31 16.14	2.1372	10 24 23.7	12.399	21	16 21 30.84	2.4718	19 10 37.5	8.908
22	14 33 24.54	2.1429	10 36 46.6	12.362	22	16 23 59.38	2.4794	19 19 28.6	8.795
23	14 35 33.29	2.1487	10 49 7.2	12.323	23	16 26 28.37	2.4869	19 28 12.9	8.680
24	14 37 42.38	2.1545	S. 11 1 25.4	12.283	24	16 28 57.81	2.4944	S. 19 36 50.2	8.562

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 17.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	16 28 57.81	2.4944	S. 19 36 50.2	8.562
1	16 31 27.70	2.5019	19 45 20.4	8.442
2	16 33 58.04	2.5093	19 53 43.3	8.321
3	16 36 28.82	2.5167	20 1 58.9	8.198
4	16 39 0.05	2.5241	20 10 7.1	8.074
5	16 41 31.72	2.5314	20 18 7.8	7.948
6	16 44 3.82	2.5387	20 26 0.9	7.820
7	16 46 36.36	2.5460	20 33 46.2	7.690
8	16 49 9.34	2.5532	20 41 23.7	7.558
9	16 51 42.75	2.5603	20 48 53.2	7.424
10	16 54 16.58	2.5674	20 56 14.6	7.289
11	16 56 50.84	2.5745	21 3 27.9	7.153
12	16 59 25.52	2.5815	21 10 33.0	7.015
13	17 2 0.62	2.5884	21 17 29.7	6.874
14	17 4 36.13	2.5952	21 24 17.9	6.732
15	17 7 12.04	2.6019	21 30 57.6	6.589
16	17 9 48.36	2.6086	21 37 28.6	6.444
17	17 12 25.08	2.6153	21 43 50.9	6.297
18	17 15 2.19	2.6218	21 50 4.3	6.149
19	17 17 39.69	2.6281	21 56 8.8	5.999
20	17 20 17.57	2.6344	22 2 4.2	5.848
21	17 22 55.82	2.6407	22 7 50.5	5.695
22	17 25 34.45	2.6469	22 13 27.6	5.540
23	17 28 13.45	2.6530	S. 22 18 55.3	5.383

SATURDAY 18.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	17 30 52.81	2.6589	S. 22 24 13.6	5.226
1	17 33 32.52	2.6647	22 29 22.4	5.067
2	17 36 12.57	2.6703	22 34 21.7	4.907
3	17 38 52.96	2.6759	22 39 11.3	4.746
4	17 41 33.68	2.6814	22 43 51.2	4.582
5	17 44 14.73	2.6867	22 48 21.2	4.417
6	17 46 56.09	2.6919	22 52 41.3	4.252
7	17 49 37.76	2.6970	22 56 51.4	4.085
8	17 52 19.73	2.7019	23 0 51.5	3.917
9	17 55 1.99	2.7067	23 4 41.4	3.747
10	17 57 44.53	2.7113	23 8 21.1	3.577
11	18 0 27.35	2.7158	23 11 50.6	3.405
12	18 3 10.43	2.7202	23 15 9.7	3.232
13	18 5 53.77	2.7244	23 18 18.4	3.058
14	18 8 37.36	2.7284	23 21 16.7	2.883
15	18 11 21.18	2.7322	23 24 4.4	2.707
16	18 14 5.23	2.7360	23 26 41.5	2.530
17	18 16 49.50	2.7397	23 29 8.0	2.353
18	18 19 33.99	2.7431	23 31 23.9	2.175
19	18 22 18.68	2.7463	23 33 29.0	1.995
20	18 25 3.55	2.7493	23 35 23.3	1.815
21	18 27 48.60	2.7522	23 37 6.8	1.634
22	18 30 33.82	2.7550	23 38 39.4	1.452
23	18 33 19.20	2.7575	23 40 1.1	1.270
24	18 36 4.73	2.7600	S. 23 41 11.8	1.088

SUNDAY 19.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	18 36 4.73	2.7600	S. 23 41 11.8	1.088
1	18 38 50.40	2.7622	23 42 11.6	0.905
2	18 41 36.19	2.7642	23 43 0.4	0.721
3	18 44 22.10	2.7661	23 43 38.1	0.536
4	18 47 8.12	2.7677	23 44 4.7	0.351
5	18 49 54.23	2.7692	23 44 20.2	− 0.166
6	18 52 40.42	2.7704	23 44 24.6	+ 0.019
7	18 55 26.68	2.7716	23 44 17.9	0.204
8	18 58 13.01	2.7726	23 44 0.1	0.389
9	19 0 59.39	2.7733	23 43 31.2	0.575
10	19 3 45.81	2.7738	23 42 51.1	0.761
11	19 6 32.25	2.7742	23 41 59.8	0.947
12	19 9 18.71	2.7743	23 40 57.4	1.133
13	19 12 5.17	2.7743	23 39 43.8	1.319
14	19 14 51.63	2.7742	23 38 19.1	1.505
15	19 17 38.07	2.7738	23 36 43.2	1.691
16	19 20 24.48	2.7732	23 34 56.2	1.876
17	19 23 10.85	2.7725	23 32 58.1	2.061
18	19 25 57.18	2.7716	23 30 48.9	2.246
19	19 28 43.44	2.7704	23 28 28.6	2.431
20	19 31 29.63	2.7691	23 25 57.2	2.615
21	19 34 15.73	2.7676	23 23 14.8	2.798
22	19 37 1.74	2.7659	23 20 21.4	2.981
23	19 39 47.64	2.7640	S. 23 17 17.1	3.163

MONDAY 20.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	19 42 33.42	2.7620	S. 23 14 1.9	3.344
1	19 45 19.08	2.7598	23 10 35.8	3.526
2	19 48 4.60	2.7574	23 6 58.8	3.707
3	19 50 49.97	2.7548	23 3 11.0	3.886
4	19 53 35.18	2.7521	22 59 12.5	4.065
5	19 56 20.23	2.7493	22 55 3.2	4.243
6	19 59 5.10	2.7463	22 50 43.3	4.420
7	20 1 49.78	2.7431	22 46 12.8	4.596
8	20 4 34.27	2.7397	22 41 31.8	4.771
9	20 7 18.55	2.7362	22 36 40.3	4.945
10	20 10 2.61	2.7325	22 31 38.4	5.118
11	20 12 46.45	2.7287	22 26 26.1	5.290
12	20 15 30.06	2.7247	22 21 3.6	5.460
13	20 18 13.42	2.7206	22 15 30.9	5.630
14	20 20 56.53	2.7163	22 9 48.0	5.799
15	20 23 39.38	2.7119	22 3 55.0	5.966
16	20 26 21.96	2.7074	21 57 52.1	6.131
17	20 29 4.27	2.7027	21 51 39.3	6.296
18	20 31 46.29	2.6979	21 45 16.6	6.459
19	20 34 28.02	2.6930	21 38 44.2	6.620
20	20 37 9.45	2.6879	21 32 2.2	6.780
21	20 39 50.57	2.6827	21 25 10.6	6.939
22	20 42 31.37	2.6774	21 18 9.5	7.096
23	20 45 11.86	2.6721	21 10 59.1	7.251
24	20 47 52.02	2.6666	S. 21 3 39.4	7.405

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	20 47 52.02	2.6666	S. 21 3 39.4	7.405
1	20 50 31.85	2.6610	20 56 10.5	7.557
2	20 53 11.34	2.6552	20 48 32.5	7.708
3	20 55 50.48	2.6493	20 40 45.5	7.857
4	20 58 29.26	2.6433	20 32 49.6	8.005
5	21 1 7.68	2.6373	20 24 44.9	8.150
6	21 3 45.74	2.6312	20 16 31.6	8.293
7	21 6 23.43	2.6251	20 8 9.7	8.436
8	21 9 0.75	2.6188	19 59 39.3	8.577
9	21 11 37.69	2.6125	19 51 0.5	8.715
10	21 14 14.25	2.6062	19 42 13.5	8.852
11	21 16 50.43	2.5997	19 33 18.3	8.987
12	21 19 26.22	2.5932	19 24 15.1	9.119
13	21 22 1.61	2.5865	19 15 4.0	9.250
14	21 24 36.60	2.5798	19 5 45.1	9.380
15	21 27 11.19	2.5731	18 56 18.4	9.508
16	21 29 45.38	2.5664	18 46 44.1	9.633
17	21 32 19.16	2.5596	18 37 2.4	9.756
18	21 34 52.53	2.5527	18 27 13.4	9.877
19	21 37 25.49	2.5458	18 17 17.1	9.997
20	21 39 58.03	2.5389	18 7 13.7	10.116
21	21 42 30.16	2.5320	17 57 3.2	10.232
22	21 45 1.87	2.5250	17 46 45.8	10.346
23	21 47 33.16	2.5179	S. 17 36 21.7	10.457

WEDNESDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	21 50 4.02	2.5108	S. 17 25 51.0	10.567
1	21 52 34.46	2.5038	17 15 13.7	10.675
2	21 55 4.48	2.4968	17 4 30.0	10.781
3	21 57 34.08	2.4897	16 53 40.0	10.885
4	22 0 3.25	2.4826	16 42 43.8	10.987
5	22 2 31.99	2.4755	16 31 41.6	11.087
6	22 5 0.31	2.4684	16 20 33.4	11.185
7	22 7 28.20	2.4613	16 9 19.4	11.281
8	22 9 55.66	2.4542	15 57 59.7	11.375
9	22 12 22.70	2.4471	15 46 34.4	11.467
10	22 14 49.31	2.4399	15 35 3.7	11.557
11	22 17 15.49	2.4328	15 23 27.6	11.645
12	22 19 41.25	2.4257	15 11 46.3	11.731
13	22 22 6.58	2.4187	14 59 59.9	11.815
14	22 24 31.49	2.4117	14 48 8.5	11.897
15	22 26 55.98	2.4046	14 36 12.2	11.977
16	22 29 20.04	2.3976	14 24 11.2	12.056
17	22 31 43.69	2.3907	14 12 5.5	12.132
18	22 34 6.92	2.3837	13 59 55.3	12.207
19	22 36 29.73	2.3767	13 47 40.7	12.279
20	22 38 52.13	2.3698	13 35 21.8	12.350
21	22 41 14.11	2.3629	13 22 58.7	12.419
22	22 43 35.68	2.3561	13 10 31.5	12.486
23	22 45 56.84	2.3493	12 58 0.4	12.551
24	22 48 17.59	2.3425	S. 12 45 25.4	12.614

THURSDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	22 48 17.59	2.3425	S. 12 45 25.4	12.614
1	22 50 37.94	2.3358	12 32 46.7	12.675
2	22 52 57.89	2.3292	12 20 4.4	12.735
3	22 55 17.44	2.3225	12 7 18.5	12.793
4	22 57 36.59	2.3159	11 54 29.2	12.849
5	22 59 55.35	2.3093	11 41 36.6	12.902
6	23 2 13.71	2.3028	11 28 40.9	12.954
7	23 4 31.69	2.2964	11 15 42.1	13.005
8	23 6 49.28	2.2900	11 2 40.3	13.054
9	23 9 6.49	2.2837	10 49 35.6	13.101
10	23 11 23.32	2.2774	10 36 28.2	13.146
11	23 13 39.78	2.2711	10 23 18.1	13.189
12	23 15 55.86	2.2649	10 10 5.5	13.231
13	23 18 11.57	2.2588	9 56 50.4	13.271
14	23 20 26.92	2.2528	9 43 33.0	13.309
15	23 22 41.91	2.2468	9 30 13.3	13.346
16	23 24 56.54	2.2408	9 16 51.5	13.381
17	23 27 10.81	2.2349	9 3 27.6	13.415
18	23 29 24.73	2.2291	8 50 1.7	13.447
19	23 31 38.31	2.2234	8 36 34.0	13.477
20	23 33 51.54	2.2177	8 23 4.5	13.505
21	23 36 4.43	2.2121	8 9 33.4	13.532
22	23 38 16.99	2.2066	7 56 0.7	13.558
23	23 40 29.22	2.2010	S. 7 42 26.5	13.583

FRIDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	23 42 41.11	2.1955	S. 7 28 50.8	13.606
1	23 44 52.68	2.1902	7 15 13.8	13.626
2	23 47 3.94	2.1850	7 1 35.7	13.644
3	23 49 14.88	2.1798	6 47 56.5	13.662
4	23 51 25.51	2.1746	6 34 16.3	13.678
5	23 53 35.83	2.1695	6 20 35.1	13.694
6	23 55 45.85	2.1645	6 6 53.0	13.707
7	23 57 55.57	2.1596	5 53 10.2	13.719
8	0 0 5.00	2.1547	5 39 26.7	13.731
9	0 2 14.14	2.1499	5 25 42.5	13.741
10	0 4 22.99	2.1452	5 11 57.8	13.748
11	0 6 31.57	2.1406	4 58 12.7	13.754
12	0 8 39.87	2.1360	4 44 27.3	13.759
13	0 10 47.89	2.1315	4 30 41.6	13.764
14	0 12 55.65	2.1272	4 16 55.6	13.767
15	0 15 3.15	2.1228	4 3 9.5	13.768
16	0 17 10.39	2.1185	3 49 23.4	13.768
17	0 19 17.37	2.1142	3 35 37.3	13.767
18	0 21 24.10	2.1101	3 21 51.3	13.765
19	0 23 30.58	2.1060	3 8 5.5	13.761
20	0 25 36.82	2.1021	2 54 20.0	13.757
21	0 27 42.83	2.0982	2 40 34.7	13.752
22	0 29 48.61	2.0944	2 26 49.8	13.744
23	0 31 54.16	2.0907	2 13 5.4	13.735
24	0 33 59.49	2.0870	S. 1 59 21.6	13.725

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 25.					MONDAY 27.				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	0 33 59.49	2.0870	S. 1 59 21.6	13.725	0	2 11 17.98	1.9940	N. 8 29 14.0	12.126
1	0 36 4.60	2.0833	1 45 38.4	13.715	1	2 13 17.61	1.9936	8 41 20.0	12.072
2	0 38 9.49	2.0797	1 31 55.8	13.703	2	2 15 17.22	1.9933	8 53 22.7	12.018
3	0 40 14.17	2.0763	1 18 14.0	13.690	3	2 17 16.81	1.9931	9 5 22.2	11.964
4	0 42 18.65	2.0730	1 4 33.0	13.676	4	2 19 16.39	1.9930	9 17 18.4	11.908
5	0 44 22.93	2.0697	0 50 52.9	13.660	5	2 21 15.97	1.9929	9 29 11.2	11.852
6	0 46 27.01	2.0664	0 37 13.8	13.644	6	2 23 15.54	1.9928	9 41 0.7	11.796
7	0 48 30.90	2.0632	0 23 35.7	13.627	7	2 25 15.11	1.9928	9 52 46.8	11.739
8	0 50 34.60	2.0602	S. 0 9 58.6	13.609	8	2 27 14.68	1.9929	10 4 29.4	11.681
9	0 52 38.12	2.0572	N. 0 3 37.4	13.590	9	2 29 14.26	1.9930	10 16 8.5	11.622
10	0 54 41.46	2.0542	0 17 12.2	13.569	10	2 31 13.84	1.9932	10 27 44.0	11.562
11	0 56 44.63	2.0513	0 30 45.7	13.547	11	2 33 13.44	1.9934	10 39 15.9	11.502
12	0 58 47.62	2.0485	0 44 17.9	13.525	12	2 35 13.05	1.9937	10 50 44.2	11.441
13	1 0 50.45	2.0458	0 57 48.7	13.502	13	2 37 12.68	1.9940	11 2 8.8	11.380
14	1 2 53.12	2.0432	1 11 18.1	13.477	14	2 39 12.33	1.9943	11 13 29.8	11.319
15	1 4 55.63	2.0406	1 24 46.0	13.452	15	2 41 12.00	1.9947	11 24 47.1	11.256
16	1 6 57.99	2.0381	1 38 12.3	13.425	16	2 43 11.70	1.9952	11 36 0.6	11.192
17	1 9 0.20	2.0357	1 51 37.0	13.397	17	2 45 11.43	1.9957	11 47 10.2	11.128
18	1 11 2.27	2.0333	2 5 0.0	13.369	18	2 47 11.18	1.9962	11 58 16.0	11.064
19	1 13 4.20	2.0311	2 18 21.3	13.340	19	2 49 10.97	1.9969	12 9 17.9	10.999
20	1 15 6.00	2.0289	2 31 40.8	13.310	20	2 51 10.80	1.9976	12 20 15.9	10.933
21	1 17 7.66	2.0267	2 44 58.5	13.279	21	2 53 10.68	1.9983	12 31 9.9	10.867
22	1 19 9.20	2.0246	2 58 14.3	13.247	22	2 55 10.60	1.9990	12 41 59.9	10.800
23	1 21 10.61	2.0225	N. 3 11 28.1	13.214	23	2 57 10.56	1.9997	N.12 52 45.9	10.732
SUNDAY 26.					TUESDAY 28.				
0	1 23 11.90	2.0206	N. 3 24 39.9	13.180	0	2 59 10.57	2.0006	N.13 3 27.8	10.664
1	1 25 13.08	2.0188	3 37 49.7	13.146	1	3 1 10.63	2.0015	13 14 5.6	10.596
2	1 27 14.15	2.0170	3 50 57.4	13.110	2	3 3 10.75	2.0024	13 24 39.3	10.527
3	1 29 15.12	2.0153	4 4 2.9	13.073	3	3 5 10.92	2.0033	13 35 8.8	10.456
4	1 31 15.98	2.0136	4 17 6.2	13.036	4	3 7 11.15	2.0043	13 45 34.0	10.384
5	1 33 16.75	2.0120	4 30 7.2	12.998	5	3 9 11.44	2.0054	13 55 54.9	10.313
6	1 35 17.42	2.0104	4 43 5.9	12.959	6	3 11 11.80	2.0065	14 6 11.6	10.242
7	1 37 18.00	2.0090	4 56 2.3	12.920	7	3 13 12.22	2.0076	14 16 24.0	10.170
8	1 39 18.50	2.0077	5 8 56.3	12.879	8	3 15 12.71	2.0087	14 26 32.0	10.097
9	1 41 18.92	2.0063	5 21 47.8	12.837	9	3 17 13.27	2.0099	14 36 35.6	10.023
10	1 43 19.26	2.0050	5 34 36.8	12.795	10	3 19 13.90	2.0111	14 46 34.8	9.949
11	1 45 19.52	2.0038	5 47 23.2	12.752	11	3 21 14.60	2.0123	14 56 29.5	9.874
12	1 47 19.71	2.0027	6 0 7.1	12.709	12	3 23 15.38	2.0136	15 6 19.7	9.799
13	1 49 19.84	2.0017	6 12 48.3	12.664	13	3 25 16.24	2.0150	15 16 5.4	9.723
14	1 51 19.91	2.0007	6 25 26.8	12.619	14	3 27 17.18	2.0163	15 25 46.5	9.647
15	1 53 19.92	1.9997	6 38 2.6	12.573	15	3 29 18.20	2.0177	15 35 23.0	9.570
16	1 55 19.88	1.9988	6 50 35.6	12.526	16	3 31 19.31	2.0192	15 44 54.9	9.492
17	1 57 19.78	1.9979	7 3 5.7	12.479	17	3 33 20.50	2.0206	15 54 22.1	9.414
18	1 59 19.63	1.9972	7 15 33.0	12.431	18	3 35 21.78	2.0221	16 3 44.6	9.336
19	2 1 19.44	1.9965	7 27 57.4	12.382	19	3 37 23.15	2.0236	16 13 2.4	9.257
20	2 3 19.21	1.9959	7 40 18.8	12.332	20	3 39 24.61	2.0251	16 22 15.4	9.177
21	2 5 18.95	1.9953	7 52 37.2	12.281	21	3 41 26.16	2.0267	16 31 23.6	9.096
22	2 7 18.65	1.9948	8 4 52.5	12.230	22	3 43 27.81	2.0282	16 40 26.9	9.015
23	2 9 18.33	1.9944	8 17 4.8	12.179	23	3 45 29.55	2.0298	16 49 25.4	8.934
24	2 11 17.98	1.9940	N. 8 29 14.0	12.126	24	3 47 31.39	2.0315	N.16 58 19.0	8.852

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	3 47 31.39	2.0315	N.16 58 19.0	8.852
1	3 49 33.33	2.0332	17 7 7.7	8.770
2	3 51 35.37	2.0348	17 15 51.4	8.687
3	3 53 37.50	2.0364	17 24 30.1	8.602
4	3 55 39.74	2.0381	17 33 3.7	8.517
5	3 57 42.08	2.0399	17 41 32.2	8.432
6	3 59 44.53	2.0417	17 49 55.6	8.347
7	4 1 47.08	2.0434	17 58 13.9	8.262
8	4 3 49.74	2.0452	18 6 27.1	8.177
9	4 5 52.51	2.0471	18 14 35.1	8.090
10	4 7 55.39	2.0488	18 22 37.9	8.002
11	4 9 58.37	2.0506	18 30 35.4	7.914
12	4 12 1.46	2.0524	18 38 27.6	7.826
13	4 14 4.66	2.0543	18 46 14.5	7.737
14	4 16 7.98	2.0562	18 53 56.1	7.648
15	4 18 11.41	2.0581	19 1 32.3	7.558
16	4 20 14.95	2.0599	19 9 3.1	7.467
17	4 22 18.60	2.0618	19 16 28.4	7.376
18	4 24 22.36	2.0637	19 23 48.2	7.284
19	4 26 26.24	2.0656	19 31 2.5	7.193
20	4 28 30.23	2.0674	19 38 11.3	7.101
21	4 30 34.33	2.0693	19 45 14.6	7.008
22	4 32 38.55	2.0712	19 52 12.3	6.914
23	4 34 42.88	2.0731	N.19 59 4.3	6.820

THURSDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	4 36 47.32	2.0750	N.20 5 50.7	6.726
1	4 38 51.88	2.0769	20 12 31.4	6.631
2	4 40 56.55	2.0788	20 19 6.4	6.536
3	4 43 1.34	2.0807	20 25 35.7	6.440
4	4 45 6.24	2.0826	20 31 59.2	6.344
5	4 47 11.25	2.0845	20 38 17.0	6.248
6	4 49 16.38	2.0864	20 44 29.0	6.151
7	4 51 21.62	2.0882	20 50 35.1	6.053
8	4 53 26.97	2.0901	20 56 35.3	5.954
9	4 55 32.43	2.0919	21 2 29.6	5.856
10	4 57 38.00	2.0937	21 8 18.0	5.757
11	4 59 43.68	2.0956	21 14 0.5	5.658
12	5 1 49.47	2.0974	21 19 37.0	5.558
13	5 3 55.37	2.0992	21 25 7.5	5.458
14	5 6 1.38	2.1010	21 30 32.0	5.357
15	5 8 7.49	2.1028	21 35 50.4	5.257
16	5 10 13.71	2.1046	21 41 2.8	5.156
17	5 12 20.04	2.1063	21 46 9.1	5.054
18	5 14 26.47	2.1080	21 51 9.2	4.951
19	5 16 33.00	2.1097	21 56 3.2	4.849
20	5 18 39.63	2.1114	22 0 51.1	4.746
21	5 20 46.37	2.1131	22 5 32.8	4.642
22	5 22 53.20	2.1147	22 10 8.2	4.538
23	5 25 0.13	2.1163	22 14 37.4	4.434
24	5 27 7.16	2.1179	N.22 19 0.3	4.330

FRIDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	5 27 7.16	2.1179	N.22 19 0.3	4.330
1	5 29 14.28	2.1194	22 23 17.0	4.226
2	5 31 21.49	2.1210	22 27 27.4	4.120
3	5 33 28.80	2.1226	22 31 31.4	4.014
4	5 35 36.20	2.1240	22 35 29.1	3.909
5	5 37 43.68	2.1254	22 39 20.5	3.803
6	5 39 51.25	2.1269	22 43 5.5	3.697
7	5 41 58.91	2.1283	22 46 44.1	3.590
8	5 44 6.65	2.1297	22 50 16.3	3.482
9	5 46 14.47	2.1310	22 53 42.0	3.375
10	5 48 22.37	2.1323	22 57 1.3	3.268
11	5 50 30.35	2.1336	23 0 14.2	3.161
12	5 52 38.40	2.1348	23 3 20.6	3.053
13	5 54 46.53	2.1361	23 6 20.5	2.944
14	5 56 54.73	2.1372	23 9 13.9	2.835
15	5 59 2.99	2.1382	23 12 0.7	2.726
16	6 1 11.32	2.1393	23 14 41.0	2.617
17	6 3 19.71	2.1404	23 17 14.7	2.507
18	6 5 28.17	2.1414	23 19 41.9	2.398
19	6 7 36.68	2.1423	23 22 2.5	2.288
20	6 9 45.25	2.1433	23 24 16.5	2.178
21	6 11 53.88	2.1442	23 26 23.9	2.067
22	6 14 2.56	2.1451	23 28 24.6	1.957
23	6 16 11.29	2.1459	N.23 30 18.7	1.847

SATURDAY, FEBRUARY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	6 18 20.06	2.1466	N.23 32 6.2	1.736

PHASES OF THE MOON.

		d	h	m
○ Full Moon . . .	Jan.	5	17	36.8
☾ Last Quarter		13	18	32.7
● New Moon		20	11	49.0
☽ First Quarter		27	8	16.4

		d	h
☾ Apogee	Jan.	6	0.5
☾ Perigee		20	2.7

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff	IXh.	P. L. of Diff.
1	Fomalhaut	W.	76° 38′ 23″	3118	78° 6′ 10″	3124	79° 33′ 50″	3130	81° 1′ 23″	3136
	α Pegasi	W.	60 58 5	3476	62 18 56	3469	63 39 55	3461	65 1 2	3457
	Pollux	E.	63 3 12	2947	61 31 53	2954	60 0 43	2963	58 29 44	2970
	Regulus	E.	98 55 20	2936	97 23 46	2943	95 52 22	2951	94 21 8	2958
2	Fomalhaut	W.	88 17 22	3165	89 44 13	3171	91 10 57	3177	92 37 34	3182
	α Pegasi	W.	71 47 48	3441	73 9 18	3439	74 30 51	3438	75 52 24	3437
	α Arietis	W.	28 20 16	3645	29 38 2	3591	30 56 46	3545	32 16 20	3506
	Pollux	E.	50 57 15	3008	49 27 13	3016	47 57 20	3023	46 27 36	3030
	Regulus	E.	86 47 10	2991	85 16 46	2997	83 46 30	3003	82 16 21	3008
	SATURN	E.	92 6 56	2975	90 36 12	2981	89 5 35	2986	87 35 5	2991
3	Fomalhaut	W.	99 48 56	3211	101 14 52	3217	102 40 40	3223	104 6 21	3229
	α Pegasi	W.	82 40 11	3441	84 1 42	3442	85 23 11	3444	86 44 37	3446
	α Arietis	W.	39 3 14	3377	40 25 57	3359	41 49 0	3344	42 12 20	3331
	Pollux	E.	39 1 2	3064	37 32 8	3071	36 3 23	3078	34 34 47	3083
	Regulus	E.	74 47 10	3032	73 17 37	3036	71 48 9	3040	70 18 46	3043
	SATURN	E.	80 4 8	3014	78 34 13	3018	77 4 23	3022	75 34 37	3026
4	α Pegasi	W.	93 31 3	3463	94 52 8	3468	96 13 8	3473	97 34 4	3478
	α Arietis	W.	50 12 25	3282	51 36 57	3276	53 1 37	3269	54 26 25	3263
	Pollux	E.	27 14 13	3132	25 46 42	3143	24 19 25	3156	22 52 23	3171
	Regulus	E.	62 52 56	3060	61 23 58	3063	59 55 3	3066	58 26 12	3069
	SATURN	E.	68 6 51	3041	66 37 29	3043	65 8 10	3046	63 38 54	3048
	Spica	E.	116 49 31	3089	115 21 8	3090	113 52 46	3091	112 24 26	3092
5	α Pegasi	W.	104 17 8	3508	105 37 23	3516	106 57 30	3524	108 17 27	3533
	α Arietis	W.	61 31 56	3241	62 57 17	3237	64 22 42	3234	65 48 11	3231
	Aldebaran	W.	29 32 51	3091	31 1 12	3089	32 29 35	3088	33 57 59	3087
	Regulus	E.	51 2 40	3079	49 34 5	3082	48 5 33	3083	46 37 3	3085
	SATURN	E.	56 13 10	3057	54 44 8	3058	53 15 7	3060	51 46 8	3061
	Spica	E.	105 3 5	3097	103 34 52	3098	102 6 40	3099	100 38 30	3100
6	α Arietis	W.	72 56 26	3218	74 22 14	3216	75 48 4	3214	77 13 57	3212
	Aldebaran	W.	41 20 16	3083	42 48 46	3082	44 17 17	3082	45 45 49	3080
	Regulus	E.	39 15 4	3094	37 46 46	3096	36 18 31	3097	34 50 18	3099
	SATURN	E.	44 21 32	3064	42 52 39	3065	41 23 47	3066	39 54 56	3067
	Spica	E.	93 17 43	3100	91 49 34	3100	90 21 25	3099	88 53 15	3099
	MARS	E.	103 57 43	3284	102 33 13	3283	101 8 42	3283	99 44 11	3283
7	Aldebaran	W.	53 8 53	3073	54 37 35	3072	56 6 19	3070	57 35 6	3068
	Regulus	E.	27 29 51	3112	26 1 56	3117	24 34 7	3121	22 6 23	3128
	SATURN	E.	32 30 49	3068	31 2 0	3069	29 33 12	3069	28 4 25	3070
	Spica	E.	81 32 20	3096	80 4 6	3095	78 35 51	3094	77 7 34	3093
	MARS	E.	92 41 21	3277	91 16 43	3275	89 52 3	3274	88 27 21	3272
8	Aldebaran	W.	64 59 39	3056	66 28 43	3052	67 57 51	3049	69 27 3	3045
	Pollux	W.	21 11 38	3167	22 38 26	3149	24 5 36	3135	25 33 3	3123
	Spica	E.	69 45 44	3084	68 17 15	3082	66 48 44	3080	65 20 11	3078
	MARS	E.	81 23 15	3260	79 58 17	3257	78 33 15	3254	77 8 10	3250
9	Aldebaran	W.	76 54 13	3025	78 23 55	3020	79 53 43	3016	81 23 36	3010

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^{h}.	P. L. of Diff.	XVIII^{h}.	P. L. of Diff.	XXI^{h}.	P. L. of Diff.
1	Fomalhaut	W.	82° 28′ 49″	3142	83° 56′ 8″	3148	85° 23′ 19″	3154	86° 50′ 24″	3160
	α Pegasi	W.	66 22 14	3452	67 43 32	3448	69 4 54	3445	70 26 19	3443
	Pollux	E.	56 58 54	2978	55 28 14	2987	53 57 45	2995	52 27 26	3001
	Regulus	E.	92 50 3	2965	91 19 7	2973	89 48 20	2979	88 17 41	2985
2	Fomalhaut	W.	94 4 4	3187	95 30 28	3193	96 56 44	3199	98 22 54	3205
	α Pegasi	W.	77 13 58	3437	78 35 32	3437	79 57 6	3438	81 18 39	3439
	α Arietis	W.	33 36 37	3474	34 57 30	3444	36 18 57	3418	37 40 53	3396
	Pollux	E.	44 58 1	3036	43 28 33	3043	41 59 14	3051	40 30 4	3057
	Regulus	E.	80 46 18	3013	79 16 22	3018	77 46 32	3023	76 16 48	3028
	SATURN	E.	86 4 41	2997	84 34 24	3001	83 4 13	3006	81 34 8	3010
3	Fomalhaut	W.	105 31 55	3236	106 57 21	3242	108 22 40	3249	109 47 52	3256
	α Pegasi	W.	88 6 1	3449	89 27 22	3452	90 48 39	3455	92 9 53	3459
	α Arietis	W.	44 35 56	3318	45 59 46	3308	47 23 48	3299	48 48 1	3289
	Pollux	E.	33 6 20	3093	31 38 2	3101	30 9 53	3111	28 41 57	3121
	Regulus	E.	68 49 27	3047	67 20 13	3051	65 51 3	3054	64 21 57	3058
	SATURN	E.	74 4 56	3029	72 35 19	3032	71 5 46	3035	69 36 17	3038
4	α Pegasi	W.	98 54 53	3484	100 15 37	3490	101 36 14	3496	102 56 45	3502
	α Arietis	W.	55 51 20	3258	57 16 21	3253	58 41 27	3248	60 6 39	3244
	Pollux	E.	21 25 39	3189	19 59 17	3213	18 33 23	3241	17 8 3	3275
	Regulus	E.	56 57 24	3071	55 28 39	3073	53 59 57	3075	52 31 17	3078
	SATURN	E.	62 9 40	3050	60 40 29	3052	59 11 20	3054	57 42 14	3056
	Spica	E.	110 56 8	3093	109 27 50	3094	107 59 34	3095	106 31 19	3096
5	α Pegasi	W.	109 37 15	3542	110 56 52	3552	112 16 19	3562	113 35 34	3575
	α Arietis	W.	67 13 44	3228	68 39 20	3225	70 4 59	3223	71 30 41	3220
	Aldebaran	W.	35 26 25	3086	36 54 51	3086	38 23 18	3085	39 51 46	3083
	Regulus	E.	45 8 35	3087	43 40 9	3088	42 11 45	3090	40 43 23	3092
	SATURN	E.	50 17 11	3062	48 48 15	3063	47 19 20	3064	45 50 26	3064
	Spica	E.	99 10 19	3100	97 42 10	3100	96 14 1	3100	94 45 51	3100
6	α Arietis	W.	78 39 52	3210	80 5 50	3208	81 31 50	3205	82 57 53	3204
	Aldebaran	W.	47 14 23	3079	48 42 58	3078	50 11 35	3077	51 40 13	3075
	Regulus	E.	33 22 7	3101	31 53 58	3103	30 25 52	3106	28 57 50	3109
	SATURN	E.	38 26 6	3067	36 57 16	3067	35 28 26	3068	33 59 37	3069
	Spica	E.	87 25 6	3098	85 56 56	3098	84 28 44	3097	83 0 33	3097
	MARS	E.	98 19 39	3282	96 55 6	3281	95 30 32	3280	94 5 57	3279
7	Aldebaran	W.	59 3 55	3065	60 32 47	3064	62 1 41	3061	63 30 38	3058
	Regulus	E.	21 38 47	3136	20 11 21	3145	18 44 6	3157	17 17 6	3177
	SATURN	E.	26 35 39	3071	25 6 54	3073	23 38 11	3075	22 9 31	3079
	Spica	E.	75 39 16	3091	74 10 56	3090	72 42 34	3088	71 14 10	3086
	MARS	E.	87 2 37	3270	85 37 51	3268	84 13 2	3265	82 48 10	3263
8	Aldebaran	W.	70 56 20	3042	72 25 41	3039	73 55 6	3034	75 24 37	3030
	Pollux	W.	27 0 45	3111	28 28 41	3100	29 56 51	3090	31 25 13	3081
	Spica	E.	63 51 34	3075	62 22 54	3072	60 54 11	3069	59 25 24	3066
	MARS	E.	75 43 0	3247	74 17 46	3243	72 52 27	3238	71 27 3	3234
9	Aldebaran	W.	82 53 36	3005	84 23 43	2998	85 53 58	2993	87 24 20	2988

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
9	Pollux	W.	32° 53′ 46″	3071	34° 22′ 31″	3063	35° 51′ 26″	3054	37° 20′ 32″	3046
	Spica	E.	57 56 35	3063	56 27 41	3060	54 58 44	3057	53 29 43	3054
	Mars	E.	70 1 34	3229	68 35 59	3224	67 10 19	3219	65 44 33	3213
	Antares	E.	103 49 31	3050	102 20 20	3045	100 51 3	3039	99 21 38	3033
10	Aldebaran	W.	88 54 50	2980	90 25 28	2973	91 56 15	2965	93 27 11	2958
	Pollux	W.	44 48 33	3005	46 18 40	2997	47 48 57	2989	49 19 25	2979
	Spica	E.	46 3 35	3037	44 34 9	3034	43 4 39	3031	41 35 4	3028
	Mars	E.	58 33 57	3183	57 7 28	3176	55 40 50	3169	54 14 4	3161
	Antares	E.	91 52 50	3002	90 22 40	2995	88 52 23	2988	87 21 56	2981
	Sun	E.	133 22 28	3355	131 59 20	3348	130 36 4	3340	129 12 38	3332
11	Pollux	W.	56 54 38	2931	58 26 17	2921	59 58 9	2911	61 30 14	2900
	Spica	E.	34 6 25	3016	32 36 35	3019	31 6 46	3020	29 36 57	3022
	Antares	E.	79 47 14	2940	78 15 46	2930	76 44 6	2920	75 12 14	2911
	Sun	E.	122 13 0	3285	120 48 31	3275	119 23 50	3265	117 58 57	3253
12	Pollux	W.	69 14 12	2842	70 47 45	2830	72 21 34	2817	73 55 39	2804
	Regulus	W.	33 20 57	2856	34 54 12	2842	36 27 46	2827	38 1 39	2811
	Saturn	W.	28 22 42	2832	29 56 29	2817	31 30 35	2802	33 5 0	2788
	Antares	E.	67 29 45	2860	65 56 35	2849	64 23 9	2837	62 49 29	2825
	Sun	E.	110 51 9	3193	109 24 51	3180	107 58 18	3167	106 31 29	3153
13	Pollux	W.	81 50 30	2735	83 26 24	2720	85 2 37	2705	86 39 10	2689
	Regulus	W.	45 55 55	2737	47 31 46	2722	49 7 57	2706	50 44 29	2690
	Saturn	W.	41 1 51	2714	42 38 12	2698	44 14 54	2683	45 51 57	2667
	Antares	E.	54 57 17	2764	53 22 2	2752	51 46 30	2739	50 10 42	2726
	Sun	E.	99 13 3	3078	97 44 27	3063	96 15 32	3047	94 46 17	3030
14	Regulus	W.	58 52 38	2607	60 31 23	2590	62 10 32	2572	63 50 5	2555
	Saturn	W.	54 2 38	2585	55 41 54	2568	57 21 33	2550	59 1 36	2533
	Antares	E.	42 7 25	2663	40 29 56	2651	38 52 11	2639	37 14 10	2629
	Sun	E.	87 14 46	2943	85 43 22	2926	84 11 36	2908	82 39 27	2889
15	Regulus	W.	72 13 53	2466	73 55 54	2448	75 38 20	2431	77 21 11	2413
	Saturn	W.	67 27 56	2445	69 10 27	2427	70 53 23	2409	72 36 45	2391
	Spica	W.	19 14 6	2746	20 49 45	2691	22 26 37	2640	24 4 37	2593
	Sun	E.	74 52 41	2794	73 18 6	2776	71 43 7	2756	70 7 42	2737
16	Regulus	W.	86 1 53	2323	87 47 19	2305	89 33 11	2288	91 19 28	2270
	Saturn	W.	81 20 3	2301	83 6 1	2284	84 52 24	2266	86 39 13	2249
	Spica	W.	32 28 32	2422	34 11 35	2395	35 55 16	2370	37 39 33	2345
	Sun	E.	62 4 17	2642	60 26 19	2623	58 47 56	2605	57 9 8	2587
17	Regulus	W.	100 17 9	2188	102 5 54	2172	103 55 3	2158	105 44 34	2143
	Spica	W.	46 29 24	2238	48 16 54	2219	50 4 52	2202	51 53 18	2184
	Mars	W.	29 30 53	2364	31 15 20	2346	33 0 14	2328	34 45 33	2311
	Sun	E.	48 48 56	2499	47 7 42	2482	45 26 4	2467	43 44 5	2452
18	Spica	W.	61 1 40	2107	62 52 28	2093	64 43 37	2080	66 35 6	2069
	Mars	W.	43 38 3	2235	45 25 38	2222	47 13 32	2210	49 1 45	2198
	Sun	E.	35 8 56	2384	33 24 58	2372	31 40 43	2362	29 56 13	2352

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff	XXI^h.	P. L. of Diff.
9	Pollux	W.	38° 49′ 48″	3038	40° 19′ 14″	3030	41° 48′ 50″	3022	42° 18′ 36″	3013
	Spica	E.	52 0 38	3050	50 31 28	3047	49 2 15	3044	47 32 57	3040
	Mars	E.	64 18 39	3208	62 52 39	3203	61 26 33	3196	60 0 19	3189
	Antares	E.	97 52 7	3028	96 22 29	3022	94 52 44	3015	93 22 51	3009
10	Aldebaran	W.	94 58 16	2950	96 29 31	2942	98 0 56	2933	99 32 33	2925
	Pollux	W.	50 50 4	2969	52 20 56	2961	53 51 58	2951	55 23 12	2941
	Spica	E.	40 5 27	3025	38 35 45	3023	37 6 1	3021	35 36 14	3019
	Mars	E.	52 47 8	3153	51 20 3	3144	49 52 47	3136	48 25 21	3127
	Antares	E.	85 51 19	2973	84 20 33	2965	82 49 37	2957	81 18 31	2949
	Sun	E.	127 49 3	3323	126 25 18	3314	125 1 23	3305	123 37 17	3295
11	Pollux	W.	63 2 33	2889	64 35 6	2878	66 7 53	2866	67 40 55	2855
	Spica	E.	28 7 12	3029	26 37 36	3035	25 8 7	3044	23 38 49	3059
	Antares	E.	73 40 10	2902	72 7 54	2892	70 35 24	2882	69 2 42	2871
	Sun	E.	116 33 51	3242	115 8 32	3230	113 42 59	3218	112 17 11	3206
12	Pollux	W.	75 30 2	2790	77 4 43	2777	78 39 41	2764	80 14 56	2750
	Regulus	W.	39 35 52	2798	41 10 23	2782	42 45 14	2766	44 20 24	2752
	Saturn	W.	34 39 43	2773	36 14 46	2759	37 50 8	2744	39 25 50	2729
	Antares	E.	61 15 35	2813	59 41 24	2801	58 6 58	2788	56 32 15	2776
	Sun	E.	105 4 23	3138	103 37 0	3124	102 9 19	3109	100 41 20	3094
13	Pollux	W.	88 16 4	2673	89 53 20	2658	91 30 56	2643	93 8 53	2628
	Regulus	W.	52 21 23	2674	53 58 38	2657	55 36 16	2640	57 14 16	2624
	Saturn	W.	47 29 21	2651	49 7 7	2634	50 45 15	2618	52 23 45	2601
	Antares	E.	48 34 36	2713	46 58 14	2701	45 21 35	2688	43 44 39	2675
	Sun	E.	93 16 41	3013	91 46 45	2996	90 16 27	2978	88 45 47	2961
14	Regulus	W.	65 30 1	2537	67 10 22	2520	68 51 8	2502	70 32 18	2484
	Saturn	W.	60 42 3	2516	62 22 54	2498	64 4 10	2481	65 45 50	2462
	Antares	E.	35 35 55	2619	33 57 26	2610	32 18 45	2603	30 39 54	2598
	Sun	E.	81 6 54	2870	79 33 57	2851	78 0 36	2831	76 26 51	2813
15	Regulus	W.	79 4 28	2394	80 48 11	2377	82 32 19	2359	84 16 53	2341
	Saturn	W.	74 20 33	2373	76 4 46	2355	77 49 26	2337	79 34 31	2319
	Spica	W.	25 43 41	2551	27 23 43	2515	29 4 35	2483	30 46 12	2452
	Sun	E.	68 31 52	2718	66 55 36	2699	65 18 55	2681	63 41 49	2661
16	Regulus	W.	93 6 11	2253	94 53 19	2237	96 40 51	2220	98 28 48	2204
	Saturn	W.	88 26 27	2232	90 14 7	2215	92 2 12	2199	93 50 41	2183
	Spica	W.	39 24 26	2322	41 9 53	2299	42 55 53	2279	44 42 23	2258
	Sun	E.	55 29 55	2569	53 50 17	2551	52 10 14	2533	50 29 47	2516
17	Regulus	W.	107 34 27	2128	109 24 43	2115	111 15 19	2102	113 6 15	2090
	Spica	W.	53 42 10	2167	55 31 27	2150	57 21 8	2135	59 11 13	2121
	Mars	W.	36 31 17	2294	38 17 25	2278	40 3 56	2264	41 50 49	2249
	Sun	E.	42 1 44	2436	40 19 1	2422	38 35 58	2409	36 52 36	2396
18	Spica	W.	68 26 52	2058	70 18 55	2048	72 11 14	2039	74 3 47	2030
	Mars	W.	50 50 15	2188	52 39 1	2177	54 28 3	2168	56 17 19	2158
	Sun	E.	28 11 30	2344	26 26 34	2335	24 41 26	2330	22 56 10	2325

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
22	Sun	W.	21° 40′ 22″	2384	23° 24′ 20″	2394	25° 8′ 3″	2406	26° 51′ 29″	2417
	α Arietis	E.	73 23 14	2203	71 34 51	2218	69 46 51	2235	67 59 16	2252
	Aldebaran	E.	103 57 32	2060	102 5 31	2071	100 13 48	2084	98 22 24	2098
23	Sun	W.	35 24 5	2491	37 5 32	2507	38 46 36	2523	40 27 17	2541
	α Arietis	E.	59 8 15	2356	57 23 37	2380	55 39 33	2405	53 56 6	2432
	Aldebaran	E.	89 10 48	2171	87 21 37	2188	85 32 51	2204	83 44 30	2222
24	Sun	W.	48 44 22	2635	50 22 29	2655	52 0 9	2675	53 37 22	2695
	α Arietis	E.	45 29 0	2590	43 49 51	2628	42 11 34	2667	40 34 10	2711
	Aldebaran	E.	74 49 17	2311	73 3 34	2330	71 18 19	2349	69 33 31	2368
25	Sun	W.	61 36 43	2797	63 11 14	2818	64 45 18	2838	66 18 56	2858
	Aldebaran	E.	60 56 30	2465	59 14 27	2484	57 32 51	2504	55 51 42	2522
26	Sun	W.	74 0 37	2959	75 31 41	2978	77 2 21	2997	78 32 37	3017
	Fomalhaut	W.	49 24 38	2930	50 56 19	2931	52 27 58	2936	53 59 31	2943
	Aldebaran	E.	47 32 44	2619	45 54 15	2638	44 16 11	2657	42 38 33	2675
	Pollux	E.	91 45 55	2621	90 7 29	2640	88 29 28	2657	86 51 50	2674
27	Sun	W.	85 58 9	3107	87 26 10	3125	88 53 49	3142	90 21 8	3158
	Fomalhaut	W.	61 35 10	2980	63 5 49	2989	64 36 15	2998	66 6 30	3008
	α Pegasi	W.	47 21 10	3555	48 40 34	3532	50 0 23	3511	51 20 35	3495
	Aldebaran	E.	34 36 28	2766	33 1 15	2783	31 26 25	2801	29 51 59	2819
	Pollux	E.	78 49 29	2759	77 14 7	2775	75 39 6	2790	74 4 25	2806
28	Sun	W.	97 32 58	3234	98 58 27	3248	100 23 39	3262	101 48 35	3276
	Fomalhaut	W.	73 34 40	3058	75 3 40	3068	76 32 29	3077	78 1 6	3087
	α Pegasi	W.	58 5 25	3443	59 26 53	3436	60 48 29	3432	62 10 9	3428
	Pollux	E.	66 15 54	2877	64 43 6	2890	63 10 34	2903	61 38 19	2916
29	Sun	W.	108 49 32	3335	110 13 3	3345	111 36 22	3355	112 59 29	3365
	Fomalhaut	W.	85 21 13	3135	86 48 40	3143	88 15 56	3151	89 43 2	3160
	α Pegasi	W.	68 59 10	3423	70 21 0	3423	71 42 50	3425	73 4 38	3426
	α Arietis	W.	25 42 7	3753	26 57 58	3684	28 15 2	3625	29 33 9	3578
	Pollux	E.	54 1 3	2975	52 30 19	2985	50 59 48	2995	49 29 29	3005
	Regulus	E.	89 52 40	2959	88 21 36	2969	86 50 44	2978	85 20 3	2987
	Saturn	E.	93 44 8	2928	92 12 25	2940	90 40 57	2950	89 9 42	2957
30	Sun	W.	119 52 25	3408	121 14 32	3416	122 36 31	3423	123 58 22	3429
	Fomalhaut	W.	96 55 57	3202	98 22 3	3210	99 48 0	3218	101 13 47	3226
	α Pegasi	W.	79 53 9	3437	81 14 43	3440	82 36 14	3443	83 57 41	3446
	α Arietis	W.	36 15 3	3415	37 37 2	3395	38 59 24	3378	40 22 5	3363
	Pollux	E.	42 0 56	3052	40 31 48	3061	39 2 50	3069	37 34 3	3078
	Regulus	E.	77 49 16	3025	76 19 34	3031	74 50 0	3037	73 20 33	3043
	Saturn	E.	81 35 45	2993	80 5 24	3000	78 35 12	3006	77 5 7	3012
31	α Pegasi	W.	90 43 58	3465	92 5 1	3469	93 25 58	3473	94 46 51	3478
	α Arietis	W.	47 19 20	3308	48 43 22	3300	50 7 33	3293	51 31 53	3287
	Pollux	E.	30 12 45	3123	28 45 3	3133	27 17 33	3144	25 50 16	3157
	Regulus	E.	65 54 58	3067	64 26 8	3070	62 57 22	3074	61 28 41	3077
	Saturn	E.	69 36 14	3034	68 6 44	3038	66 37 18	3041	65 7 56	3045

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh.	P. L. of Diff.
22	Sun	W.	28° 34′ 39″	2429	30° 17′ 32″	2443	32° 0′ 6″	2459	33° 42′ 17″	2475
	α Arietis	E.	66 12 6	2271	64 25 24	2290	62 39 10	2311	60 53 27	2332
	Aldebaran	E.	96 31 21	2111	94 40 39	2126	92 50 19	2141	91 0 22	2156
23	Sun	W.	42 7 33	2559	43 47 24	2578	45 26 49	2597	47 5 49	2616
	α Arietis	E.	52 13 17	2460	50 31 8	2490	48 49 41	2521	47 8 57	2555
	Aldebaran	E.	81 56 35	2239	80 9 6	2257	78 22 3	2275	76 35 27	2293
24	Sun	W.	55 14 8	2716	56 50 27	2736	58 26 19	2756	60 1 44	2776
	α Arietis	E.	38 57 45	2757	37 22 21	2806	35 48 3	2862	34 14 55	2921
	Aldebaran	E.	67 49 11	2387	66 5 18	2407	64 21 54	2427	62 38 58	2447
25	Sun	W.	67 52 8	2879	69 24 53	2899	70 57 13	2919	72 29 8	2939
	Aldebaran	E.	54 11 1	2543	52 30 47	2562	50 51 0	2581	49 11 39	2600
26	Sun	W.	80 2 29	3035	81 31 58	3054	83 1 4	3073	84 29 47	3090
	Fomalhaut	W.	55 30 56	2950	57 2 11	2956	58 33 19	2962	60 4 19	2969
	Aldebaran	E.	41 1 19	2693	39 24 30	2711	37 48 5	2730	36 12 5	2748
	Pollux	E.	85 14 36	2692	83 37 46	2709	82 1 18	2726	80 25 12	2743
27	Sun	W.	91 48 8	3174	93 14 48	3190	94 41 9	3205	96 7 12	3220
	Fomalhaut	W.	67 36 32	3018	69 6 22	3028	70 36 0	3037	72 5 26	3047
	α Pegasi	W.	52 41 5	3480	54 1 52	3468	55 22 52	3457	56 44 4	3449
	Aldebaran	E.	28 17 56	2836	26 44 15	2855	25 10 58	2874	23 38 7	2893
	Pollux	E.	72 30 5	2821	70 56 4	2835	69 22 22	2850	67 48 59	2864
28	Sun	W.	103 13 15	3289	104 37 40	3300	106 1 51	3312	107 25 48	3324
	Fomalhaut	W.	79 29 31	3097	80 57 44	3107	82 25 45	3117	83 53 34	3125
	α Pegasi	W.	63 31 53	3496	64 53 40	3494	66 15 29	3493	67 37 19	3492
	Pollux	E.	60 6 21	2929	58 34 39	2941	57 3 13	2953	55 32 1	2964
29	Sun	W.	114 22 25	3375	115 45 10	3385	117 7 44	3393	118 30 9	3400
	Fomalhaut	W.	91 9 57	3168	92 36 42	3176	94 3 17	3185	95 29 42	3194
	α Pegasi	W.	74 26 25	3428	75 48 10	3430	77 9 52	3432	78 31 32	3434
	α Arietis	W.	30 52 11	3533	32 11 59	3496	33 32 28	3466	34 53 30	3438
	Pollux	E.	47 59 23	3015	46 29 29	3025	44 59 47	3034	43 30 16	3043
	Regulus	E.	83 49 34	2995	82 19 15	3003	80 49 6	3010	79 19 6	3018
	Saturn	E.	87 38 36	2965	86 7 39	2973	84 36 52	2980	83 6 14	2987
30	Sun	W.	125 20 6	3435	126 41 43	3441	128 3 13	3446	129 24 37	3452
	Fomalhaut	W.	102 39 25	3233	104 4 55	3240	105 30 16	3248	106 55 27	3255
	α Pegasi	W.	85 19 4	3450	86 40 24	3453	88 1 40	3457	89 22 51	3461
	α Arietis	W.	41 45 4	3350	43 8 18	3337	44 31 47	3326	45 55 28	3317
	Pollux	E.	36 5 26	3086	34 36 59	3095	33 8 43	3104	31 40 38	3114
	Regulus	E.	71 51 14	3048	70 22 1	3053	68 52 54	3058	67 23 53	3063
	Saturn	E.	75 35 9	3017	74 5 17	3021	72 35 30	3026	71 5 49	3030
31	α Pegasi	W.	96 7 39	3483	97 28 22	3488	98 49 0	3493	100 9 31	3499
	α Arietis	W.	52 56 20	3280	54 20 55	3275	55 45 36	3270	57 10 23	3264
	Pollux	E.	24 23 15	3170	22 56 30	3185	21 30 3	3204	20 3 59	3225
	Regulus	E.	60 0 3	3080	58 31 29	3082	57 2 58	3084	55 34 29	3086
	Saturn	E.	63 38 39	3047	62 9 24	3048	60 40 11	3050	59 11 0	3052

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Sat.	1	21 0 28.45	10.176	S. 17 1 17.3	+42.91	16 16.04	68.24	13 51.75	0.319
SUN.	2	21 4 32.25	10.142	16 43 58.6	43.64	16 15.89	68.13	13 58.98	0.285
Mon.	3	21 8 35.22	10.107	16 26 22.5	44.36	16 15.74	68.01	14 5.38	0.251
Tues.	4	21 12 37.37	10.073	16 8 29.4	+45.06	16 15.58	67.90	14 10.96	0.217
Wed.	5	21 16 38.71	10.039	15 50 19.7	45.74	16 15.41	67.78	14 15.73	0.183
Thur.	6	21 20 39.24	10.005	15 31 53.8	46.41	16 15.24	67.67	14 19.69	0.149
Frid.	7	21 24 38.96	9.972	15 13 12.0	+47.06	16 15.06	67.55	14 22.84	0.116
Sat.	8	21 28 37.89	9.940	14 54 14.7	47.70	16 14.88	67.44	14 25.21	0.084
SUN.	9	21 32 36.05	9.908	14 35 2.4	48.32	16 14.70	67.33	14 26.81	0.052
Mon.	10	21 36 33.44	9.876	14 15 35.5	+48.92	16 14.51	67.22	14 27.64	0.020
Tues.	11	21 40 30.07	9.845	13 55 54.4	49.51	16 14.32	67.11	14 27.71	0.011
Wed.	12	21 44 25.95	9.814	13 35 59.5	50.08	16 14.12	67.00	14 27.04	0.042
Thur.	13	21 48 21.09	9.783	13 15 51.2	+50.63	16 13.92	66.89	14 25.63	0.073
Frid.	14	21 52 15.50	9.752	12 55 29.8	51.16	16 13.72	66.78	14 23.50	0.103
Sat.	15	21 56 9.19	9.722	12 34 55.8	51.67	16 13.51	66.68	14 20.64	0.133
SUN.	16	22 0 2.16	9.692	12 14 9.6	+52.17	16 13.30	66.58	14 17.06	0.163
Mon.	17	22 3 54.43	9.663	11 53 11.7	52.65	16 13.08	66.48	14 12.78	0.192
Tues.	18	22 7 46.01	9.635	11 32 2.5	53.11	16 12.87	66.38	14 7.82	0.220
Wed.	19	22 11 36.91	9.607	11 10 42.4	+53.56	16 12.65	66.28	14 2.18	0.248
Thur.	20	22 15 27.13	9.579	10 49 11.8	53.99	16 12.43	66.18	13 55.87	0.276
Frid.	21	22 19 16.68	9.552	10 27 31.1	54.40	16 12.21	66.09	13 48.89	0.303
Sat.	22	22 23 5.59	9.525	10 5 40.8	+54.79	16 11.99	66.00	13 41.27	0.330
SUN.	23	22 26 53.86	9.499	9 43 41.4	55.16	16 11.76	65.91	13 33.01	0.356
Mon.	24	22 30 41.50	9.473	9 21 33.3	55.52	16 11.54	65.82	13 24.12	0.382
Tues.	25	22 34 28.53	9.448	8 59 16.8	+55.86	16 11.31	65.73	13 14.62	0.407
Wed.	26	22 38 14.97	9.424	8 36 52.3	56.18	16 11.08	65.64	13 4.54	0.431
Thur.	27	22 42 0.83	9.400	8 14 20.4	56.48	16 10.85	65.56	12 53.88	0.455
Frid.	28	22 45 46.13	9.377	7 51 41.4	56.77	16 10.62	65.48	12 42.66	0.478
Sat.	29	22 49 30.89	9.355	S. 7 28 55.7	+57.03	16 10.38	65.41	12 30.89	0.500

NOTE.—The mean time of semidiameter passing may be found by subtracting $0^s.18$ from the sidereal time.

The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Sat.	1	21 0 26.10	10.175	S. 17 1 27.2	+42.90	13 51.67	0.319	20 46 34.43
SUN.	2	21 4 29.89	10.141	16 44 8.8	43.63	13 58.91	0.285	20 50 30.98
Mon.	3	21 8 32.85	10.107	16 26 33.0	44.35	14 5.32	0.251	20 54 27.54
Tues.	4	21 12 35.00	10.073	16 8 40.1	+45.05	14 10.91	0.217	20 58 24.09
Wed.	5	21 16 36.33	10.039	15 50 30.6	45.73	14 15.69	0.183	21 2 20.65
Thur.	6	21 20 36.86	10.005	15 32 4.9	46.40	14 19.66	0.149	21 6 17.20
Frid.	7	21 24 36.58	9.972	15 13 23.3	+47.05	14 22.82	0.116	21 10 13.76
Sat.	8	21 28 35.51	9.940	14 54 26.2	47.69	14 25.20	0.084	21 14 10.31
SUN.	9	21 32 33.67	9.908	14 35 14.1	48.31	14 26.80	0.052	21 18 6.87
Mon.	10	21 36 31.06	9.876	14 15 47.4	+48.91	14 27.64	0.020	21 22 3.42
Tues.	11	21 40 27.70	9.845	13 56 6.4	49.50	14 27.72	0.011	21 25 59.98
Wed.	12	21 44 23.59	9.814	13 36 11.6	50.07	14 27.05	0.042	21 29 56.53
Thur.	13	21 48 18.74	9.783	13 16 3.4	+50.62	14 25.65	0.073	21 33 53.09
Frid.	14	21 52 13.16	9.753	12 55 42.1	51.15	14 23.52	0.103	21 37 49.64
Sat.	15	21 56 6.86	9.723	12 35 8.2	51.67	14 20.67	0.133	21 41 46.20
SUN.	16	21 59 59.85	9.693	12 14 22.1	+52.17	14 17.10	0.163	21 45 42.75
Mon.	17	22 3 52.14	9.664	11 53 24.2	52.65	14 12.83	0.192	21 49 39.31
Tues.	18	22 7 43.74	9.636	11 32 15.0	53.11	14 7.88	0.220	21 53 35.86
Wed.	19	22 11 34.66	9.608	11 10 55.0	+53.56	14 2.24	0.248	21 57 32.42
Thur.	20	22 15 24.90	9.580	10 49 24.4	53.99	13 55.93	0.276	22 1 28.97
Frid.	21	22 19 14.48	9.553	10 27 43.7	54.40	13 48.96	0.303	22 5 25.52
Sat.	22	22 23 3.42	9.526	10 5 53.4	+54.79	13 41.34	0.330	22 9 22.07
SUN.	23	22 26 51.72	9.500	9 43 54.0	55.16	13 33.09	0.356	22 13 18.63
Mon.	24	22 30 39.39	9.474	9 21 45.8	55.52	13 24.21	0.382	22 17 15.18
Tues.	25	22 34 26 45	9.449	8 59 29.2	+55.86	13 14.71	0.407	22 21 11.74
Wed.	26	22 38 12.92	9.425	8 37 4.6	56.18	13 4.63	0.431	22 25 8.29
Thur.	27	22 41 58.81	9.401	8 14 32.6	56.48	12 53.97	0.455	22 29 4.84
Frid.	28	22 45 44.14	9.378	7 51 53.5	56.77	12 42.75	0.478	22 33 1.39
Sat.	29	22 49 28.94	9.356	S. 7 29 7.6	+57.04	12 30.99	0.500	22 36 57.95

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

Diff. for 1 hour,
+ 9ˢ.8565.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	32	312 38 48.8	39 0.4	152.12	+ 0.21	9.9937105	+27.0	3 12 53.88
2	33	313 39 38.9	39 50.4	152.07	0.35	9.9937767	28.0	3 8 57.97
3	34	314 40 27.8	40 39.2	152.01	0.47	9.9938452	29.0	3 5 2.06
4	35	315 41 15.4	41 26.7	151.96	+ 0.58	9.9939161	+30.0	3 1 6.15
5	36	316 42 1.8	42 13.0	151.91	0.67	9.9939894	31.1	2 57 10.25
6	37	317 42 47.0	42 58.0	151.86	0.74	9.9940652	32.1	2 53 14.35
7	38	318 43 31.0	43 41.8	151.81	+ 0.78	9.9941434	+33.1	2 49 18.44
8	39	319 44 13.9	44 24.5	151.76	0.78	9.9942239	34.0	2 45 22.53
9	40	320 44 55.6	45 6.1	151.71	0.76	9.9943066	34.9	2 41 26.61
10	41	321 45 36.2	45 46.6	151.66	+ 0.71	9.9943913	+35.7	2 37 30.70
11	42	322 46 15.7	46 26.0	151.62	0.63	9.9944778	36.4	2 33 34.79
12	43	323 46 54.1	47 4.3	151.57	0.53	9.9945661	37.1	2 29 38.88
13	44	324 47 31.4	47 41.5	151.53	+ 0.42	9.9946560	+37.8	2 25 42.97
14	45	325 48 7.5	48 17.5	151.48	0.30	9.9947474	38.3	2 21 47.06
15	46	326 48 42.3	48 52.2	151.43	0.17	9.9948400	38.8	2 17 51.15
16	47	327 49 15.8	49 25.5	151.37	+ 0.04	9.9949337	+39.3	2 13 55.24
17	48	328 49 47.9	49 57.5	151.31	− 0.08	9.9950285	39.7	2 9 59.34
18	49	329 50 18.6	50 28.1	151.24	0.19	9.9951242	40.1	2 6 3.43
19	50	330 50 47.7	50 57.1	151.17	− 0.27	9.9952208	+40.4	2 2 7.52
20	51	331 51 15.2	51 24.4	151.10	0.32	9.9953182	40.8	1 58 11.61
21	52	332 51 41.0	51 50.1	151.04	0.35	9.9954164	41.1	1 54 15.71
22	53	333 52 5.1	52 14.1	150.96	− 0.34	9.9955153	+41.4	1 50 19.80
23	54	334 52 27.3	52 36.2	150.88	0.30	9.9956150	41.7	1 46 23.89
24	55	335 52 47.5	52 56.3	150.80	0.24	9.9957156	42.1	1 42 27.98
25	56	336 53 5.7	53 14.4	150.71	− 0.15	9.9958173	+42.6	1 38 32.07
26	57	337 53 22.0	53 30.6	150.63	− 0.04	9.9959200	43.0	1 34 36.17
27	58	338 53 36.2	53 44.7	150.54	+ 0.08	9.9960237	43.5	1 30 40.26
28	59	339 53 48.3	53 56.7	150.46	0.21	9.9961286	44.0	1 26 44.36
29	60	340 53 58.3	54 6.6	150.37	+ 0.35	9.9962348	+44.6	1 22 48.45

Note.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January $0^d.0$.

Diff. for 1 Hour
— $9^s.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 45.5	14 44.7	54 2.7	−0.30	54 0.0	−0.15	9 51.3	2.05	11.5
2	14 44.4	14 44.6	53 59.0	−0.02	53 59.5	+0.11	10 40.6	2.04	12.5
3	14 45.2	14 46.1	54 1.6	+0.23	54 5.0	0.33	11 29.4	2.01	13.5
4	14 47.3	14 48.9	54 9.6	+0.43	54 15.4	+0.53	12 17.0	1.95	14.5
5	14 50.8	14 53.0	54 22.4	0.63	54 30.4	0.71	13 3.1	1.89	15.5
6	14 55.5	14 58.2	54 39.5	0.80	54 49.6	0.89	13 47.8	1.84	16.5
7	15 1.3	15 4.6	55 0.8	+0.98	55 13.1	+1.07	14 31.4	1.84	17.5
8	15 8.3	15 12.2	55 26.5	1.17	55 41.1	1.26	15 14.8	1.85	18.5
9	15 16.5	15 21.1	55 56.8	1.36	56 13.6	1.45	15 58.6	1.87	19.5
10	15 26.0	15 31.2	56 31.6	+1.55	56 50.8	+1.64	16 43.9	1.94	20.5
11	15 36.7	15 42.5	57 11.0	1.72	57 32.1	1.79	17 31.8	2.08	21.5
12	15 48.4	15 54.6	57 54.0	1.85	58 16.5	1.88	18 23.2	2.23	22.5
13	16 0.7	16 6.8	58 39.1	+1.88	59 1.5	+1.85	19 18.9	2.39	23.5
14	16 12.8	16 18.4	59 23.4	1.78	59 44.1	1.66	20 18.7	2.52	24.5
15	16 23.6	16 28.2	60 3.2	1.50	60 20.1	1.29	21 21.3	2.63	25.5
16	16 32.0	16 34.9	60 34.1	+1.03	60 44.8	+0.73	22 24.8	2.61	26.5
17	16 36.8	16 37.6	60 51.7	+0.40	60 54.5	+0.05	23 26.4	2.50	27.5
18	16 37.1	16 35.5	60 52.9	−0.32	60 46.8	−0.69	δ		28.5
19	16 32.6	16 28.7	60 36.4	−1.04	60 21.9	−1.36	0 24.9	2.36	0.1
20	16 23.7	16 17.9	60 3.7	1.65	59 42.3	1.90	1 19.6	2.21	1.1
21	16 11.4	16 4.3	59 18.2	2.08	58 52.3	2.22	2 10.9	2.09	2.1
22	15 56.9	15 49.3	58 25.0	−2.30	57 57.1	−2.32	2 59.8	2.00	3.1
23	15 41.7	15 34.2	57 29.3	2.30	57 1.9	2.24	3 47.0	1.95	4.1
24	15 27.1	15 20.3	56 35.6	2.14	56 10.7	2.00	4 33.8	1.95	5.1
25	15 14.0	15 8.3	55 47.6	−1.84	55 26.6	−1.66	5 20.8	1.97	6.1
26	15 3.2	14 58.7	55 7.8	1.46	54 51.5	1.26	6 8.5	2.00	7.1
27	14 55.0	14 51.9	54 37.6	1.05	54 26.3	0.84	6 57.0	2.03	8.1
28	14 49.5	14 47.7	54 17.4	0.63	54 11.1	0.43	7 46.1	2.05	9.1
29	14 46.7	14 46.2	54 7.1	−0.23	54 5.5	−0.05	8 35.5	2.05	10.1

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 1.					**MONDAY 3.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	6 18 20.06	2.1466	N.23 32 6.2	1.736	0	8 1 22.58	2.1287	N.22 47 0.8	3.583
1	6 20 28.88	2.1473	23 33 47.0	1.625	1	8 3 30.26	2.1272	22 43 22.6	3.690
2	6 22 37.74	2.1480	23 35 21.2	1.514	2	8 5 37.85	2.1257	22 39 38.0	3.796
3	6 24 46.64	2.1487	23 36 48.7	1.403	3	8 7 45.35	2.1242	22 35 47.0	3.902
4	6 26 55.58	2.1492	23 38 9.5	1.292	4	8 9 52.76	2.1226	22 31 49.7	4.008
5	6 29 4.55	2.1498	23 39 23.7	1.181	5	8 12 0.07	2.1210	22 27 46.0	4.114
6	6 31 13.56	2.1503	23 40 31.2	1.069	6	8 14 7.28	2.1193	22 23 36.0	4.219
7	6 33 22.59	2.1508	23 41 31.9	0.957	7	8 16 14.39	2.1176	22 19 19.8	4.323
8	6 35 31.65	2.1512	23 42 26.0	0.846	8	8 18 21.40	2.1159	22 14 57.3	4.428
9	6 37 40.73	2.1515	23 43 13.4	0.734	9	8 20 28.30	2.1142	22 10 28.5	4.532
10	6 39 49.83	2.1518	23 43 54.1	0.622	10	8 22 35.10	2.1123	22 5 53.5	4.635
11	6 41 58.95	2.1521	23 44 28.0	0.509	11	8 24 41.78	2.1104	22 1 12.3	4.737
12	6 44 8.09	2.1524	23 44 55.2	0.397	12	8 26 48.35	2.1086	21 56 25.0	4.840
13	6 46 17.24	2.1526	23 45 15.7	0.286	13	8 28 54.81	2.1067	21 51 31.5	4.942
14	6 48 26.40	2.1527	23 45 29.5	0.173	14	8 31 1.15	2.1047	21 46 31.9	5.043
15	6 50 35.56	2.1527	23 45 36.5	+ 0.061	15	8 33 7.38	2.1028	21 41 26.3	5.144
16	6 52 44.73	2.1527	23 45 36.8	− 0.051	16	8 35 13.49	2.1008	21 36 14.6	5.246
17	6 54 53.89	2.1527	23 45 30.4	0.163	17	8 37 19.48	2.0988	21 30 56.8	5.347
18	6 57 3.05	2.1526	23 45 17.2	0.276	18	8 39 25.35	2.0967	21 25 33.0	5.447
19	6 59 12.20	2.1525	23 44 57.3	0.387	19	8 41 31.09	2.0947	21 20 3.2	5.546
20	7 1 21.35	2.1524	23 44 30.7	0.499	20	8 43 36.71	2.0926	21 14 27.5	5.644
21	7 3 30.49	2.1522	23 43 57.4	0.611	21	8 45 42.20	2.0904	21 8 45.9	5.743
22	7 5 39.61	2.1519	23 43 17.4	0.723	22	8 47 47.56	2.0883	21 2 58.4	5.841
23	7 7 48.72	2.1516	N.23 42 30.6	0.836	23	8 49 52.80	2.0862	N.20 57 5.0	5.938
	SUNDAY 2.					**TUESDAY 4.**			
0	7 9 57.81	2.1512	N.23 41 37.1	0.947	0	8 51 57.91	2.0840	N.20 51 5.8	6.035
1	7 12 6.87	2.1508	23 40 36.9	1.059	1	8 54 2.88	2.0818	20 45 0.8	6.132
2	7 14 15.91	2.1504	23 39 30.0	1.171	2	8 56 7.72	2.0796	20 38 50.0	6.227
3	7 16 24.92	2.1499	23 38 16.4	1.282	3	8 58 12.43	2.0773	20 32 33.5	6.322
4	7 18 33.90	2.1493	23 36 56.1	1.394	4	9 0 17.00	2.0751	20 26 11.3	6.417
5	7 20 42.84	2.1487	23 35 29.1	1.505	5	9 2 21.44	2.0728	20 19 43.4	6.512
6	7 22 51.75	2.1481	23 33 55.5	1.616	6	9 4 25.74	2.0705	20 13 9.9	6.605
7	7 25 0.62	2.1474	23 32 15.2	1.727	7	9 6 29.90	2.0682	20 6 30.8	6.698
8	7 27 9.44	2.1467	23 30 28.2	1.838	8	9 8 33.92	2.0659	19 59 46.1	6.791
9	7 29 18.22	2.1459	23 28 34.6	1.948	9	9 10 37.81	2.0636	19 52 55.9	6.883
10	7 31 26.95	2.1451	23 26 34.4	2.059	10	9 12 41.56	2.0612	19 46 0.2	6.974
11	7 33 35.63	2.1442	23 24 27.5	2.170	11	9 14 45.16	2.0588	19 38 59.0	7.065
12	7 35 44.26	2.1433	23 22 14.0	2.280	12	9 16 48.62	2.0565	19 31 52.4	7.155
13	7 37 52.83	2.1423	23 19 53.9	2.390	13	9 18 51.94	2.0541	19 24 40.4	7.244
14	7 40 1.34	2.1413	23 17 27.2	2.500	14	9 20 55.12	2.0517	19 17 23.1	7.333
15	7 42 9.79	2.1402	23 14 53.9	2.609	15	9 22 58.15	2.0493	19 10 0.4	7.422
16	7 44 18.17	2.1391	23 12 14.1	2.718	16	9 25 1.04	2.0470	19 2 32.4	7.510
17	7 46 26.48	2.1380	23 9 27.7	2.827	17	9 27 3.79	2.0447	18 54 59.2	7.597
18	7 48 34.73	2.1368	23 6 34.8	2.937	18	9 29 6.40	2.0423	18 47 20.8	7.683
19	7 50 42.90	2.1356	23 3 35.3	3.046	19	9 31 8.86	2.0398	18 39 37.2	7.769
20	7 52 51.00	2.1343	23 0 29.3	3.154	20	9 33 11.18	2.0374	18 31 48.5	7.855
21	7 54 59.02	2.1330	22 57 16.9	3.261	21	9 35 13.35	2.0350	18 23 54.6	7.940
22	7 57 6.96	2.1316	22 53 58.0	3.369	22	9 37 15.38	2.0326	18 15 55.7	8.024
23	7 59 14.81	2.1302	22 50 32.6	3.476	23	9 39 17.26	2.0302	18 7 51.8	8.107
24	8 1 22.58	2.1287	N.22 47 0.8	3.583	24	9 41 19.00	2.0277	N.17 59 42.9	8.190

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 5.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	9 41 19.00	2.0277	N.17 59 42.9	8.190
1	9 43 20.59	2.0253	17 51 29.0	8.272
2	9 45 22.04	2.0230	17 43 10.2	8.353
3	9 47 23.35	2.0206	17 34 46.6	8.433
4	9 49 24.52	2.0182	17 26 18.2	8.513
5	9 51 25.54	2.0158	17 17 45.0	8.593
6	9 53 26.42	2.0135	17 9 7.0	8.672
7	9 55 27.16	2.0111	17 0 24.3	8.750
8	9 57 27.76	2.0087	16 51 37.0	8.828
9	9 59 28.21	2.0063	16 42 45.0	8.905
10	10 1 28.52	2.0040	16 33 48.4	8.981
11	10 3 28.69	2.0017	16 24 47.3	9.056
12	10 5 28.73	1.9995	16 15 41.7	9.131
13	10 7 28.63	1.9972	16 6 31.6	9.205
14	10 9 28.39	1.9949	15 57 17.1	9.278
15	10 11 28.01	1.9926	15 47 58.3	9.350
16	10 13 27.50	1.9904	15 38 35.1	9.422
17	10 15 26.86	1.9882	15 29 7.6	9.494
18	10 17 26.08	1.9859	15 19 35.8	9.565
19	10 19 25.17	1.9837	15 9 59.8	9.634
20	10 21 24.13	1.9816	15 0 19.7	9.703
21	10 23 22.96	1.9794	14 50 35.5	9.771
22	10 25 21.66	1.9773	14 40 47.2	9.839
23	10 27 20.24	1.9752	N.14 30 54.8	9.907

THURSDAY 6.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	10 29 18.69	1.9732	N.14 20 58.4	9.973
1	10 31 17.02	1.9711	14 10 58.1	10.038
2	10 33 15.22	1.9690	14 0 53.9	10.103
3	10 35 13.30	1.9670	13 50 45.8	10.168
4	10 37 11.26	1.9651	13 40 33.8	10.231
5	10 39 9.11	1.9632	13 30 18.1	10.293
6	10 41 6.84	1.9612	13 19 58.7	10.354
7	10 43 4.46	1.9593	13 9 35.6	10.416
8	10 45 1.96	1.9574	12 59 8.8	10.477
9	10 46 59.35	1.9556	12 48 38.4	10.536
10	10 48 56.63	1.9538	12 38 4.5	10.595
11	10 50 53.81	1.9521	12 27 27.0	10.654
12	10 52 50.88	1.9504	12 16 46.0	10.712
13	10 54 47.85	1.9487	12 6 1.6	10.768
14	10 56 44.72	1.9470	11 55 13.8	10.824
15	10 58 41.49	1.9453	11 44 22.7	10.879
16	11 0 38.16	1.9437	11 33 28.3	10.933
17	11 2 34.73	1.9421	11 22 30.7	10.987
18	11 4 31.21	1.9406	11 11 29.8	11.041
19	11 6 27.60	1.9392	11 0 25.8	11.093
20	11 8 23.91	1.9377	10 49 18.7	11.144
21	11 10 20.13	1.9363	10 38 8.5	11.196
22	11 12 16.27	1.9349	10 26 55.2	11.247
23	11 14 12.32	1.9335	10 15 38.9	11.296
24	11 16 8.29	1.9323	N.10 4 19.7	11.344

FRIDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	11 16 8.29	1.9323	N.10 4 19.7	11.344
1	11 18 4.19	1.9311	9 52 57.6	11.391
2	11 20 0.02	1.9298	9 41 32.7	11.438
3	11 21 55.77	1.9286	9 30 5.0	11.485
4	11 23 51.45	1.9275	9 18 34.5	11.532
5	11 25 47.07	1.9265	9 7 1.2	11.577
6	11 27 42.63	1.9255	8 55 25.3	11.620
7	11 29 38.13	1.9245	8 43 46.8	11.663
8	11 31 33.57	1.9235	8 32 5.7	11.706
9	11 33 28.95	1.9226	8 20 22.1	11.748
10	11 35 24.28	1.9218	8 8 36.0	11.789
11	11 37 19.56	1.9210	7 56 47.4	11.830
12	11 39 14.80	1.9202	7 44 56.4	11.869
13	11 41 9.99	1.9195	7 33 3.1	11.908
14	11 43 5.14	1.9188	7 21 7.5	11.946
15	11 45 0.25	1.9182	7 9 9.6	11.983
16	11 46 55.33	1.9177	6 57 9.5	12.020
17	11 48 50.38	1.9172	6 45 7.2	12.056
18	11 50 45.40	1.9167	6 33 2.8	12.091
19	11 52 40.39	1.9163	6 20 56.3	12.125
20	11 54 35.36	1.9160	6 8 47.8	12.158
21	11 56 30.31	1.9157	5 56 37.3	12.191
22	11 58 25.25	1.9155	5 44 24.9	12.223
23	12 0 20.17	1.9153	N. 5 32 10.6	12.254

SATURDAY 8.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	12 2 15.08	1.9152	N. 5 19 54.4	12.285
1	12 4 9.99	1.9151	5 7 36.4	12.314
2	12 6 4.89	1.9150	4 55 16.7	12.343
3	12 7 59.79	1.9150	4 42 55.3	12.371
4	12 9 54.69	1.9151	4 30 32.2	12.398
5	12 11 49.60	1.9152	4 18 7.5	12.425
6	12 13 44.52	1.9154	4 5 41.2	12.451
7	12 15 39.45	1.9157	3 53 13.4	12.475
8	12 17 34.40	1.9160	3 40 44.2	12.499
9	12 19 29.37	1.9164	3 28 13.5	12.523
10	12 21 24.37	1.9168	3 15 41.4	12.546
11	12 23 19.39	1.9172	3 3 8.0	12.567
12	12 25 14.44	1.9178	2 50 33.4	12.588
13	12 27 9.53	1.9185	2 37 57.5	12.608
14	12 29 4.66	1.9191	2 25 20.4	12.627
15	12 30 59.82	1.9198	2 12 42.2	12.646
16	12 32 55.03	1.9206	2 0 2.9	12.664
17	12 34 50.29	1.9214	1 47 22.5	12.682
18	12 36 45.60	1.9223	1 34 41.1	12.698
19	12 38 40.97	1.9233	1 21 58.8	12.713
20	12 40 36.40	1.9243	1 9 15.6	12.727
21	12 42 31.89	1.9254	0 56 31.6	12.740
22	12 44 27.45	1.9266	0 43 46.8	12.753
23	12 46 23.08	1.9279	0 31 1.2	12.766
24	12 48 18.79	1.9292	N. 0 18 14.9	12.777

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 9.					TUESDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	12 48 18.79	1.9292	N. 0 18 14.9	12.777	0	14 23 38.56	2.0691	S. 9 51 0.7	12.243
1	12 50 14.58	1.9305	N. 0 5 28.0	12.787	1	14 25 42.84	2.0737	10 3 14.2	12.207
2	12 52 10.45	1.9318	S. 0 7 19.5	12.796	2	14 27 47.40	2.0783	10 15 25.5	12.169
3	12 54 6.40	1.9332	0 20 7.5	12.804	3	14 29 52.23	2.0829	10 27 34.5	12.131
4	12 56 2.44	1.9348	0 32 56.0	12.812	4	14 31 57.35	2.0877	10 39 41.2	12.092
5	12 57 58.58	1.9365	0 45 45.0	12.820	5	14 34 2.76	2.0926	10 51 45.5	12.051
6	12 59 54.82	1.9382	0 58 34.4	12.826	6	14 36 8.47	2.0976	11 3 47.3	12.009
7	13 1 51.16	1.9399	1 11 24.1	12.831	7	14 38 14.47	2.1025	11 15 46.6	11.967
8	13 3 47.60	1.9416	1 24 14.1	12.835	8	14 40 20.77	2.1075	11 27 43.3	11.923
9	13 5 44.15	1.9435	1 37 4.3	12.838	9	14 42 27.37	2.1126	11 39 37.3	11.877
10	13 7 40.82	1.9455	1 49 54.7	12.841	10	14 44 34.28	2.1177	11 51 28.5	11.830
11	13 9 37.61	1.9474	2 2 45.3	12.843	11	14 46 41.50	2.1230	12 3 16.9	11.782
12	13 11 34.51	1.9494	2 15 35.9	12.843	12	14 48 49.04	2.1283	12 15 2.4	11.733
13	13 13 31.54	1.9516	2 28 26.5	12.843	13	14 50 56.90	2.1337	12 26 44.9	11.683
14	13 15 28.70	1.9538	2 41 17.1	12.843	14	14 53 5.08	2.1390	12 38 24.4	11.632
15	13 17 26.00	1.9561	2 54 7.7	12.841	15	14 55 13.58	2.1444	12 50 0.8	11.580
16	13 19 23.43	1.9584	3 6 58.1	12.838	16	14 57 22.41	2.1499	13 1 34.0	11.526
17	13 21 21.01	1.9608	3 19 48.3	12.835	17	14 59 31.57	2.1555	13 13 3.9	11.471
18	13 23 18.73	1.9632	3 32 38.3	12.831	18	15 1 41.07	2.1611	13 24 30.5	11.415
19	13 25 16.60	1.9658	3 45 28.0	12.825	19	15 3 50.91	2.1668	13 35 53.7	11.357
20	13 27 14.63	1.9684	3 58 17.3	12.818	20	15 6 1.09	2.1726	13 47 13.4	11.298
21	13 29 12.81	1.9711	4 11 6.2	12.811	21	15 8 11.62	2.1784	13 58 29.5	11.237
22	13 31 11.16	1.9738	4 23 54.6	12.803	22	15 10 22.50	2.1842	14 9 41.9	11.175
23	13 33 9.67	1.9766	S. 4 36 42.6	12.795	23	15 12 33.73	2.1901	S. 14 20 50.5	11.112
	MONDAY 10.					WEDNESDAY 12.			
0	13 35 8.35	1.9794	S. 4 49 30.0	12.784	0	15 14 45.31	2.1960	S. 14 31 55.3	11.048
1	13 37 7.20	1.9823	5 2 16.7	12.773	1	15 16 57.25	2.2020	14 42 56.3	10.983
2	13 39 6.23	1.9854	5 15 2.7	12.761	2	15 19 9.55	2.2081	14 53 53.3	10.916
3	13 41 5.45	1.9886	5 27 48.0	12.748	3	15 21 22.22	2.2142	15 4 46.2	10.847
4	13 43 4.86	1.9917	5 40 32.5	12.735	4	15 23 35.26	2.2204	15 15 35.0	10.777
5	13 45 4.46	1.9949	5 53 16.2	12.720	5	15 25 48.67	2.2266	15 26 19.5	10.706
6	13 47 4.25	1.9982	6 5 58.9	12.704	6	15 28 2.45	2.2328	15 36 59.7	10.633
7	13 49 4.24	2.0016	6 18 40.6	12.687	7	15 30 16.61	2.2391	15 47 35.5	10.560
8	13 51 4.44	2.0050	6 31 21.3	12.669	8	15 32 31.14	2.2453	15 58 6.9	10.485
9	13 53 4.84	2.0084	6 44 0.9	12.650	9	15 34 46.05	2.2517	16 8 33.7	10.408
10	13 55 5.45	2.0120	6 56 39.3	12.630	10	15 37 1.34	2.2581	16 18 55.8	10.329
11	13 57 6.28	2.0157	7 9 16.5	12.610	11	15 39 17.02	2.2646	16 29 13.2	10.250
12	13 59 7.33	2.0194	7 21 52.5	12.588	12	15 41 33.09	2.2711	16 39 25.8	10.169
13	14 1 8.61	2.0231	7 34 27.1	12.565	13	15 43 49.55	2.2776	16 49 33.5	10.087
14	14 3 10.11	2.0269	7 47 0.3	12.541	14	15 46 6.40	2.2841	16 59 36.2	10.003
15	14 5 11.84	2.0308	7 59 32.0	12.516	15	15 48 23.64	2.2906	17 9 33.8	9.918
16	14 7 13.81	2.0348	8 12 2.2	12.490	16	15 50 41.27	2.2972	17 19 26.3	9.831
17	14 9 16.02	2.0388	8 24 30.8	12.462	17	15 52 59.30	2.3038	17 29 13.5	9.742
18	14 11 18.47	2.0429	8 36 57.7	12.434	18	15 55 17.72	2.3104	17 38 55.4	9.653
19	14 13 21.17	2.0472	8 49 22.9	12.405	19	15 57 36.54	2.3171	17 48 31.9	9.562
20	14 15 24.13	2.0514	9 1 46.3	12.375	20	15 59 55.77	2.3238	17 58 2.9	9.469
21	14 17 27.34	2.0557	9 14 7.9	12.343	21	16 2 15.40	2.3305	18 7 28.2	9.374
22	14 19 30.81	2.0601	9 26 27.5	12.310	22	16 4 35.43	2.3372	18 16 47.8	9.279
23	14 21 34.55	2.0646	9 38 45.1	12.277	23	16 6 55.86	2.3439	18 26 1.7	9.182
24	14 23 38.56	2.0691	S. 9 51 0.7	12.243	24	16 9 16.70	2.3507	S. 18 35 9.7	9.083

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	16 9 16.70	2.3507	S. 18 35 9.7	9.083
1	16 11 37.95	2.3575	18 44 11.7	8.983
2	16 13 59.60	2.3642	18 53 7.7	8.882
3	16 16 21.65	2.3709	19 1 57.6	8.780
4	16 18 44.11	2.3777	19 10 41.3	8.675
5	16 21 6.98	2.3845	19 19 18.6	8.567
6	16 23 30.25	2.3913	19 27 49.4	8.450
7	16 25 53.93	2.3981	19 36 13.7	8.351
8	16 28 18.02	2.4048	19 44 31.5	8.241
9	16 30 42.51	2.4116	19 52 42.6	8.128
10	16 33 7.41	2.4183	20 0 46.9	8.014
11	16 35 32.71	2.4251	20 8 44.3	7.899
12	16 37 58.42	2.4318	20 16 34.8	7.782
13	16 40 24.53	2.4385	20 24 18.2	7.664
14	16 42 51.04	2.4452	20 31 54.5	7.545
15	16 45 17.95	2.4518	20 39 23.6	7.424
16	16 47 45.26	2.4585	20 46 45.4	7.301
17	16 50 12.97	2.4651	20 53 59.7	7.176
18	16 52 41.07	2.4717	21 1 6.5	7.050
19	16 55 9.57	2.4782	21 8 5.7	6.923
20	16 57 38.45	2.4846	21 14 57.3	6.796
21	17 0 7.72	2.4911	21 21 41.2	6.666
22	17 2 37.38	2.4975	21 28 17.2	6.533
23	17 5 7.42	2.5038	S. 21 34 45.2	6.400

FRIDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	17 7 37.84	2.5101	S. 21 41 5.2	6.266
1	17 10 8.64	2.5164	21 47 17.1	6.130
2	17 12 39.81	2.5226	21 53 20.8	5.992
3	17 15 11.35	2.5287	21 59 16.2	5.854
4	17 17 43.26	2.5348	22 5 3.3	5.714
5	17 20 15.53	2.5409	22 10 41.9	5.572
6	17 22 48.17	2.5469	22 16 12.0	5.430
7	17 25 21.16	2.5527	22 21 33.5	5.286
8	17 27 54.50	2.5585	22 26 46.3	5.141
9	17 30 28.18	2.5642	22 31 50.4	4.994
10	17 33 2.20	2.5698	22 36 45.6	4.845
11	17 35 36.56	2.5754	22 41 31.8	4.695
12	17 38 11.25	2.5808	22 46 9.0	4.545
13	17 40 46.26	2.5862	22 50 37.2	4.393
14	17 43 21.60	2.5916	22 54 56.2	4.240
15	17 45 57.25	2.5969	22 59 6.0	4.086
16	17 48 33.21	2.6019	23 3 6.5	3.931
17	17 51 9.48	2.6069	23 6 57.7	3.775
18	17 53 46.04	2.6118	23 10 39.5	3.617
19	17 56 22.89	2.6166	23 14 11.8	3.458
20	17 59 0.03	2.6213	23 17 34.5	3.297
21	18 1 37.44	2.6258	23 20 47.5	3.136
22	18 4 15.12	2.6303	23 23 50.8	2.974
23	18 6 53.07	2.6347	23 26 44.4	2.812
24	18 9 31.28	2.6389	S. 23 29 28.2	2.647

SATURDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	18 9 31.28	2.6389	S. 23 29 28.2	2.647
1	18 12 9.74	2.6430	23 32 2.1	2.482
2	18 14 48.44	2.6469	23 34 26.1	2.317
3	18 17 27.37	2.6507	23 36 40.1	2.150
4	18 20 6.52	2.6544	23 38 44.1	1.982
5	18 22 45.90	2.6581	23 40 38.0	1.814
6	18 25 25.49	2.6615	23 42 21.8	1.645
7	18 28 5.28	2.6648	23 43 55.4	1.475
8	18 30 45.27	2.6680	23 45 18.8	1.305
9	18 33 25.44	2.6710	23 46 32.0	1.134
10	18 36 5.79	2.6739	23 47 34.9	0.962
11	18 38 46.31	2.6767	23 48 27.4	0.789
12	18 41 27.00	2.6794	23 49 9.5	0.615
13	18 44 7.84	2.6818	23 49 41.2	0.442
14	18 46 48.82	2.6841	23 50 2.5	0.268
15	18 49 29.93	2.6862	23 50 13.4	− 0.094
16	18 52 11.17	2.6883	23 50 13.8	+ 0.081
17	18 54 52.53	2.6902	23 50 3.7	0.257
18	18 57 33.99	2.6918	23 49 43.0	0.432
19	19 0 15.55	2.6935	23 49 11.8	0.608
20	19 2 57.21	2.6949	23 48 30.0	0.785
21	19 5 38.94	2.6961	23 47 37.6	0.962
22	19 8 20.74	2.6972	23 46 34.6	1.138
23	19 11 2.60	2.6982	S. 23 45 21.0	1.314

SUNDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	19 13 44.52	2.6990	S. 23 43 56.9	1.490
1	19 16 26.48	2.6996	23 42 22.2	1.668
2	19 19 8.47	2.7001	23 40 36.8	1.846
3	19 21 50.49	2.7004	23 38 40.7	2.023
4	19 24 32.52	2.7005	23 36 34.0	2.200
5	19 27 14.55	2.7005	23 34 16.7	2.376
6	19 29 56.58	2.7004	23 31 48.9	2.552
7	19 32 38.60	2.7001	23 29 10.5	2.728
8	19 35 20.59	2.6996	23 26 21.5	2.905
9	19 38 2.55	2.6990	23 23 21.9	3.081
10	19 40 44.47	2.6982	23 20 11.8	3.256
11	19 43 26.34	2.6972	23 16 51.2	3.431
12	19 46 8.14	2.6961	23 13 20.1	3.606
13	19 48 49.87	2.6949	23 9 38.5	3.780
14	19 51 31.53	2.6937	23 5 46.5	3.953
15	19 54 13.11	2.6922	23 1 44.1	4.127
16	19 56 54.60	2.6905	22 57 31.3	4.300
17	19 59 35.97	2.6885	22 53 8.1	4.472
18	20 2 17.22	2.6865	22 48 34.6	4.643
19	20 4 58.35	2.6845	22 43 50.9	4.813
20	20 7 39.36	2.6823	22 38 57.0	4.983
21	20 10 20.23	2.6799	22 33 52.9	5.153
22	20 13 0.95	2.6774	22 28 38.7	5.321
23	20 15 41.52	2.6747	22 23 14.4	5.487
24	20 18 21.92	2.6719	S. 22 17 40.2	5.653

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 17.					WEDNESDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	20 18 21.92	2.6719	S. 22 17 40.2	5.653	0	22 21 30.49	2.4342	S. 14 59 22.2	11.992
1	20 21 2.15	2.6690	22 11 56.0	5.819	1	22 23 56.36	2.4282	14 47 20.0	12.081
2	20 23 42.20	2.6660	22 6 1.9	5.984	2	22 26 21.87	2.4222	14 35 12.5	12.168
3	20 26 22.07	2.6628	21 59 57.9	6.148	3	22 28 47.03	2.4163	14 22 59.8	12.254
4	20 29 1.74	2.6595	21 53 44.1	6.310	4	22 31 11.83	2.4103	14 10 42.0	12.338
5	20 31 41.21	2.6561	21 47 20.7	6.471	5	22 33 36.27	2.4043	13 58 19.2	12.420
6	20 34 20.47	2.6526	21 40 47.6	6.632	6	22 36 0.35	2.3984	13 45 51.6	12.499
7	20 36 59.52	2.6490	21 34 4.9	6.791	7	22 38 24.08	2.3926	13 33 19.3	12.577
8	20 39 38.35	2.6452	21 27 12.7	6.948	8	22 40 47.46	2.3867	13 20 42.4	12.653
9	20 42 16.95	2.6413	21 20 11.1	7.105	9	22 43 10.48	2.3808	13 8 0.9	12.728
10	20 44 55.31	2.6372	21 13 0.1	7.261	10	22 45 33.15	2.3749	12 55 15.0	12.800
11	20 47 33.42	2.6331	21 5 39.8	7.414	11	22 47 55.47	2.3691	12 42 24.9	12.869
12	20 50 11.28	2.6289	20 58 10.4	7.567	12	22 50 17.45	2.3634	12 29 30.7	12.938
13	20 52 48.89	2.6247	20 50 31.8	7.719	13	22 52 39.08	2.3576	12 16 32.4	13.005
14	20 55 26.24	2.6203	20 42 44.1	7.869	14	22 55 0.36	2.3518	12 3 30.1	13.070
15	20 58 3.33	2.6159	20 34 47.5	8.018	15	22 57 21.30	2.3461	11 50 24.0	13.132
16	21 0 40.15	2.6112	20 26 42.0	8.165	16	22 59 41.90	2.3405	11 37 14.2	13.193
17	21 3 16.68	2.6065	20 18 27.7	8.310	17	23 2 2.16	2.3348	11 24 0.8	13.252
18	21 5 52.93	2.6017	20 10 4.8	8.454	18	23 4 22.07	2.3291	11 10 43.9	13.310
19	21 8 28.89	2.5969	20 1 33.3	8.597	19	23 6 41.65	2.3236	10 57 23.6	13.366
20	21 11 4.56	2.5920	19 52 53.2	8.739	20	23 9 0.90	2.3180	10 44 0.0	13.419
21	21 13 39.93	2.5870	19 44 4.6	8.879	21	23 11 19.81	2.3125	10 30 33.3	13.471
22	21 16 15.00	2.5820	19 35 7.7	9.017	22	23 13 38.40	2.3071	10 17 3.5	13.521
23	21 18 49.77	2.5770	S. 19 26 2.6	9.153	23	23 15 56.66	2.3016	S. 10 3 30.8	13.568
	TUESDAY 18.					THURSDAY 20.			
0	21 21 24.24	2.5718	S. 19 16 49.4	9.287	0	23 18 14.59	2.2962	S. 9 49 55.3	13.614
1	21 23 58.39	2.5664	19 7 28.2	9.420	1	23 20 32.20	2.2909	9 36 17.1	13.659
2	21 26 32.21	2.5610	18 57 59.0	9.552	2	23 22 49.49	2.2856	9 22 36.2	13.702
3	21 29 5.71	2.5556	18 48 22.0	9.682	3	23 25 6.47	2.2803	9 8 52.8	13.743
4	21 31 38.88	2.5502	18 38 37.2	9.810	4	23 27 23.13	2.2752	8 55 7.0	13.782
5	21 34 11.73	2.5447	18 28 44.8	9.936	5	23 29 39.49	2.2701	8 41 18.9	13.820
6	21 36 44.25	2.5392	18 18 44.9	10.060	6	23 31 55.54	2.2650	8 27 28.6	13.856
7	21 39 16.43	2.5336	18 8 37.6	10.183	7	23 34 11.29	2.2599	8 13 36.2	13.890
8	21 41 48.28	2.5280	17 58 22.9	10.305	8	23 36 26.73	2.2548	7 59 41.8	13.922
9	21 44 19.79	2.5223	17 48 1.0	10.424	9	23 38 41.87	2.2499	7 45 45.6	13.952
10	21 46 50.96	2.5166	17 37 32.0	10.542	10	23 40 56.72	2.2450	7 31 47.6	13.981
11	21 49 21.78	2.5109	17 26 56.0	10.657	11	23 43 11.27	2.2401	7 17 47.9	14.008
12	21 51 52.26	2.5051	17 16 13.2	10.770	12	23 45 25.53	2.2353	7 3 46.6	14.034
13	21 54 22.39	2.4992	17 5 23.6	10.882	13	23 47 39.51	2.2306	6 49 43.8	14.057
14	21 56 52.17	2.4934	16 54 27.3	10.993	14	23 49 53.20	2.2259	6 35 39.7	14.079
15	21 59 21.60	2.4875	16 43 24.4	11.102	15	23 52 6.62	2.2214	6 21 34.3	14.101
16	22 1 50.67	2.4816	16 32 15.1	11.208	16	23 54 19.77	2.2168	6 7 27.6	14.120
17	22 4 19.39	2.4757	16 20 59.5	11.313	17	23 56 32.64	2.2122	5 53 19.9	14.136
18	22 6 47.76	2.4698	16 9 37.6	11.416	18	23 58 45.24	2.2078	5 39 11.3	14.151
19	22 9 15.77	2.4639	15 58 9.6	11.517	19	0 0 57.58	2.2035	5 25 1.8	14.166
20	22 11 43.43	2.4580	15 46 35.6	11.615	20	0 3 9.66	2.1991	5 10 51.4	14.179
21	22 14 10.73	2.4520	15 34 55.8	11.712	21	0 5 21.48	2.1948	4 56 40.3	14.190
22	22 16 37.67	2.4461	15 23 10.2	11.807	22	0 7 33.04	2.1906	4 42 28.6	14.199
23	22 19 4.26	2.4402	15 11 19.0	11.900	23	0 9 44.35	2.1864	4 28 16.4	14.207
24	22 21 30.49	2.4342	S. 14 59 22.2	11.992	24	0 11 55.41	2.1823	S. 4 14 3.7	14.214

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION

FRIDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	0 11 55.41	2.1823	S. 4 14 3.7	14.214
1	0 14 6.23	2.1784	3 59 50.7	14.219
2	0 16 16.82	2.1745	3 45 37.4	14.222
3	0 18 27.17	2.1706	3 31 24.0	14.224
4	0 20 37.29	2.1667	3 17 10.5	14.224
5	0 22 47.18	2.1629	3 2 57.1	14.223
6	0 24 56.84	2.1592	2 48 43.7	14.222
7	0 27 6.29	2.1556	2 34 30.5	14.218
8	0 29 15.52	2.1520	2 20 17.6	14.212
9	0 31 24.53	2.1484	2 6 5.1	14.205
10	0 33 33.33	2.1450	1 51 53.0	14.197
11	0 35 41.93	2.1417	1 37 41.4	14.189
12	0 37 50.33	2.1384	1 23 30.3	14.179
13	0 39 58.53	2.1351	1 9 19.9	14.167
14	0 42 6.54	2.1319	0 55 10.3	14.153
15	0 44 14.36	2.1287	0 41 1.6	14.138
16	0 46 21.99	2.1257	0 26 53.8	14.122
17	0 48 29.44	2.1227	S. 0 12 47.0	14.105
18	0 50 36.71	2.1197	N. 0 1 18.8	14.087
19	0 52 43.81	2.1169	0 15 23.5	14.067
20	0 54 50.74	2.1141	0 29 26.9	14.046
21	0 56 57.50	2.1113	0 43 29.0	14.023
22	0 59 4.09	2.1086	0 57 29.7	14.000
23	1 1 10.53	2.1061	N. 1 11 29.0	13.976

SATURDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	1 3 16.82	2.1036	N. 1 25 26.8	13.950
1	1 5 22.96	2.1011	1 39 23.0	13.923
2	1 7 28.95	2.0986	1 53 17.6	13.895
3	1 9 34.79	2.0962	2 7 10.4	13.865
4	1 11 40.49	2.0939	2 21 1.4	13.835
5	1 13 46.06	2.0917	2 34 50.6	13.804
6	1 15 51.50	2.0896	2 48 37.9	13.772
7	1 17 56.81	2.0875	3 2 23.2	13.738
8	1 20 2.00	2.0854	3 16 6.4	13.703
9	1 22 7.06	2.0834	3 29 47.5	13.667
10	1 24 12.01	2.0815	3 43 26.4	13.630
11	1 26 16.84	2.0796	3 57 3.1	13.592
12	1 28 21.56	2.0778	4 10 37.5	13.553
13	1 30 26.17	2.0761	4 24 9.5	13.513
14	1 32 30.69	2.0745	4 37 39.1	13.472
15	1 34 35.11	2.0729	4 51 6.2	13.430
16	1 36 39.44	2.0713	5 4 30.7	13.387
17	1 38 43.67	2.0697	5 17 52.6	13.342
18	1 40 47.81	2.0683	5 31 11.8	13.297
19	1 42 51.87	2.0670	5 44 28.3	13.252
20	1 44 55.85	2.0657	5 57 42.0	13.205
21	1 46 59.75	2.0644	6 10 52.9	13.157
22	1 49 3.58	2.0632	6 24 0.9	13.109
23	1 51 7.34	2.0621	6 37 6.0	13.059
24	1 53 11.03	2.0610	N. 6 50 8.0	13.008

SUNDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	1 53 11.03	2.0610	N. 6 50 8.0	13.008
1	1 55 14.66	2.0600	7 3 6.9	12.956
2	1 57 18.23	2.0590	7 16 2.7	12.904
3	1 59 21.74	2.0580	7 28 55.4	12.852
4	2 1 25.19	2.0572	7 41 44.9	12.798
5	2 3 28.60	2.0564	7 54 31.1	12.743
6	2 5 31.96	2.0556	8 7 14.0	12.686
7	2 7 35.27	2.0548	8 19 53.5	12.629
8	2 9 38.54	2.0542	8 32 29.5	12.572
9	2 11 41.78	2.0537	8 45 2.1	12.514
10	2 13 44.99	2.0532	8 57 31.2	12.455
11	2 15 48.17	2.0527	9 9 56.7	12.394
12	2 17 51.32	2.0523	9 22 18.5	12.333
13	2 19 54.45	2.0519	9 34 36.7	12.272
14	2 21 57.55	2.0515	9 46 51.2	12.211
15	2 24 0.63	2.0512	9 59 2.0	12.148
16	2 26 3.70	2.0510	10 11 8.9	12.083
17	2 28 6.75	2.0508	10 23 11.9	12.018
18	2 30 9.79	2.0507	10 35 11.0	11.953
19	2 32 12.83	2.0506	10 47 6.2	11.887
20	2 34 15.86	2.0505	10 58 57.4	11.820
21	2 36 18.89	2.0505	11 10 44.6	11.752
22	2 38 21.92	2.0505	11 22 27.7	11.684
23	2 40 24.95	2.0506	N.11 34 6.7	11.615

MONDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	2 42 27.99	2.0507	N.11 45 41.5	11.545
1	2 44 31.04	2.0509	11 57 12.1	11.475
2	2 46 34.10	2.0512	12 8 38.5	11.404
3	2 48 37.18	2.0514	12 20 0.6	11.332
4	2 50 40.27	2.0517	12 31 18.4	11.260
5	2 52 43.38	2.0521	12 42 31.8	11.187
6	2 54 46.52	2.0525	12 53 40.8	11.113
7	2 56 49.68	2.0529	13 4 45.4	11.039
8	2 58 52.87	2.0533	13 15 45.5	10.964
9	3 0 56.08	2.0537	13 26 41.0	10.888
10	3 2 59.32	2.0543	13 37 32.0	10.812
11	3 5 2.60	2.0549	13 48 18.4	10.735
12	3 7 5.91	2.0555	13 59 0.2	10.657
13	3 9 9.26	2.0562	14 9 37.3	10.579
14	3 11 12.65	2.0569	14 20 9.7	10.500
15	3 13 16.08	2.0576	14 30 37.3	10.420
16	3 15 19.56	2.0583	14 41 0.1	10.340
17	3 17 23.08	2.0591	14 51 18.1	10.260
18	3 19 26.65	2.0599	15 1 31.3	10.179
19	3 21 30.27	2.0607	15 11 39.6	10.097
20	3 23 33.94	2.0616	15 21 42.9	10.014
21	3 25 37.66	2.0625	15 31 41.3	9.931
22	3 27 41.44	2.0634	15 41 34.7	9.848
23	3 29 45.27	2.0643	15 51 23.1	9.764
24	3 31 49.16	2.0653	N.16 1 6.4	9.679

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 25.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	3 31 49.16	2.0653	N.16 1 6.4	9.679
1	3 33 53.11	2.0663	16 10 44.6	9.594
2	3 35 57.12	2.0674	16 20 17.7	9.508
3	3 38 1.20	2.0685	16 29 45.6	9.422
4	3 40 5.34	2.0695	16 39 8.3	9.335
5	3 42 9.54	2.0706	16 48 25.8	9.247
6	3 44 13.81	2.0717	16 57 38.0	9.159
7	3 46 18.15	2.0729	17 6 44.9	9.071
8	3 48 22.56	2.0740	17 15 46.5	8.983
9	3 50 27.03	2.0752	17 24 42.8	8.893
10	3 52 31.58	2.0764	17 33 33.7	8.802
11	3 54 36.20	2.0777	17 42 19.1	8.712
12	3 56 40.90	2.0789	17 50 59.1	8.621
13	3 58 45.67	2.0802	17 59 33.6	8.529
14	4 0 50.52	2.0814	18 8 2.6	8.437
15	4 2 55.44	2.0827	18 16 26.1	8.345
16	4 5 0.44	2.0839	18 24 44.0	8.252
17	4 7 5.51	2.0852	18 32 56.3	8.159
18	4 9 10.66	2.0865	18 41 3.1	8.066
19	4 11 15.89	2.0878	18 49 4.2	7.971
20	4 13 21.20	2.0892	18 56 59.6	7.876
21	4 15 26.60	2.0906	19 4 49.3	7.780
22	4 17 32.07	2.0919	19 12 33.2	7.684
23	4 19 37.62	2.0933	N.19 20 11.4	7.588

WEDNESDAY 26.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	4 21 43.26	2.0947	N.19 27 43.8	7.491
1	4 23 48.98	2.0960	19 35 10.4	7.394
2	4 25 54.78	2.0973	19 42 31.1	7.297
3	4 28 0.66	2.0987	19 49 46.0	7.199
4	4 30 6.62	2.1001	19 56 55.0	7.101
5	4 32 12.67	2.1015	20 3 58.1	7.002
6	4 34 18.80	2.1029	20 10 55.3	6.903
7	4 36 25.02	2.1043	20 17 46.5	6.803
8	4 38 31.32	2.1057	20 24 31.7	6.703
9	4 40 37.70	2.1070	20 31 10.9	6.603
10	4 42 44.16	2.1083	20 37 44.1	6.502
11	4 44 50.70	2.1097	20 44 11.2	6.401
12	4 46 57.32	2.1110	20 50 32.2	6.299
13	4 49 4.02	2.1124	20 56 47.1	6.197
14	4 51 10.81	2.1138	21 2 55.9	6.095
15	4 53 17.68	2.1152	21 8 58.5	5.993
16	4 55 24.63	2.1165	21 14 55.0	5.890
17	4 57 31.66	2.1178	21 20 45.3	5.786
18	4 59 38.77	2.1192	21 26 29.3	5.682
19	5 1 45.96	2.1205	21 32 7.1	5.578
20	5 3 53.23	2.1217	21 37 38.7	5.474
21	5 6 0.57	2.1230	21 43 4.0	5.369
22	5 8 7.99	2.1242	21 48 23.0	5.264
23	5 10 15.48	2.1255	21 53 35.7	5.158
24	5 12 23.05	2.1267	N.21 58 42.0	5.053

THURSDAY 27.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	5 12 23.05	2.1267	N.21 58 42.0	5.053
1	5 14 30.69	2.1279	22 3 42.0	4.947
2	5 16 38.40	2.1292	22 8 35.6	4.840
3	5 18 46.19	2.1304	22 13 22.8	4.733
4	5 20 54.05	2.1316	22 18 3.6	4.627
5	5 23 1.98	2.1327	22 22 38.0	4.520
6	5 25 9.97	2.1338	22 27 6.0	4.412
7	5 27 18.03	2.1349	22 31 27.5	4.304
8	5 29 26.16	2.1360	22 35 42.5	4.196
9	5 31 34.35	2.1370	22 39 51.0	4.087
10	5 33 42.60	2.1380	22 43 53.0	3.979
11	5 35 50.91	2.1391	22 47 48.5	3.870
12	5 37 59.29	2.1401	22 51 37.4	3.761
13	5 40 7.72	2.1410	22 55 19.8	3.652
14	5 42 16.21	2.1420	22 58 55.6	3.542
15	5 44 24.76	2.1429	23 2 24.8	3.432
16	5 46 33.36	2.1437	23 5 47.5	3.323
17	5 48 42.01	2.1446	23 9 3.6	3.213
18	5 50 50.71	2.1454	23 12 13.0	3.102
19	5 52 59.46	2.1462	23 15 15.8	2.992
20	5 55 8.26	2.1470	23 18 12.0	2.881
21	5 57 17.10	2.1478	23 21 1.5	2.770
22	5 59 25.99	2.1485	23 23 44.4	2.659
23	6 1 34.92	2.1491	N.23 26 20.6	2.547

FRIDAY 28.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	6 3 43.88	2.1497	N.23 28 50.1	2.436
1	6 5 52.88	2.1503	23 31 12.9	2.324
2	6 8 1.92	2.1509	23 33 29.0	2.213
3	6 10 10.99	2.1514	23 35 38.5	2.101
4	6 12 20.09	2.1519	23 37 41.2	1.989
5	6 14 29.22	2.1524	23 39 37.2	1.877
6	6 16 38.38	2.1528	23 41 26.4	1.764
7	6 18 47.56	2.1533	23 43 8.9	1.652
8	6 20 56.77	2.1537	23 44 44.7	1.540
9	6 23 6.00	2.1540	23 46 13.7	1.427
10	6 25 15.25	2.1542	23 47 36.0	1.315
11	6 27 24.51	2.1544	23 48 51.5	1.202
12	6 29 33.78	2.1546	23 50 0.3	1.090
13	6 31 43.07	2.1548	23 51 2.3	0.977
14	6 33 52.36	2.1549	23 51 57.5	0.864
15	6 36 1.66	2.1551	23 52 46.0	0.751
16	6 38 10.97	2.1552	23 53 27.7	0.638
17	6 40 20.28	2.1552	23 54 2.6	0.526
18	6 42 29.59	2.1552	23 54 30.8	0.413
19	6 44 38.90	2.1551	23 54 52.2	0.300
20	6 46 48.20	2.1550	23 55 6.8	0.187
21	6 48 57.50	2.1549	23 55 14.6	+ 0.074
22	6 51 6.79	2.1547	23 55 15.6	− 0.039
23	6 53 16.06	2.1544	23 55 9.9	0.152
24	6 55 25.32	2.1542	N.23 54 57.4	0.265

GREENWICH MEAN TIME.

PHASES OF THE MOON.

		d	h	m
○ Full Moon	Feb.	4	13	13.5
☾ Last Quarter		12	6	51.4
● New Moon		18	22	27.7
☽ First Quarter		26	2	6.4

		d	h
☾ Apogee	Feb.	2	2.3
☾ Perigee		17	13.7

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	α Pegasi	W.	101° 29′ 58″	3505	102° 50′ 17″	3511	104° 10′ 30″	3517	105° 30′ 36″	3524
	α Arietis	W.	58 35 16	3259	60 0 15	3255	61 25 19	3250	62 50 29	3246
	Aldebaran	W.	26 30 54	3109	27 58 53	3106	29 26 55	3104	30 55 0	3102
	Regulus	E.	54 6 3	3088	52 37 39	3090	51 9 17	3091	49 40 57	3092
	Saturn	E.	57 41 52	3053	56 12 45	3055	54 43 40	3056	53 14 36	3056
	Spica	E.	108 5 50	3108	106 37 51	3108	105 9 52	3108	103 41 53	3108
2	α Arietis	W.	69 57 27	3226	71 23 5	3223	72 48 47	3220	74 14 33	3215
	Aldebaran	W.	38 16 0	3092	39 44 19	3090	41 12 41	3087	42 41 6	3085
	Regulus	E.	42 19 31	3095	40 51 15	3096	39 23 0	3096	37 54 45	3096
	Saturn	E.	45 49 23	3056	44 20 20	3056	42 51 16	3054	41 22 11	3054
	Spica	E.	96 21 53	3104	94 53 49	3103	93 25 45	3102	91 57 39	3101
3	α Arietis	W.	81 24 31	3198	82 50 43	3193	84 17 0	3190	85 43 21	3187
	Aldebaran	W.	50 3 58	3071	51 32 43	3068	53 1 32	3065	54 30 25	3061
	Saturn	E.	33 56 28	3048	32 27 15	3047	30 58 0	3046	29 28 44	3044
	Spica	E.	84 36 35	3090	83 8 14	3088	81 39 50	3086	80 11 23	3084
	Mars	E.	110 7 7	3251	108 41 58	3248	107 16 46	3245	105 51 30	3242
4	Aldebaran	W.	61 55 54	3043	63 25 14	3039	64 54 39	3035	66 24 9	3030
	Spica	E.	72 48 17	3068	71 19 28	3065	69 50 35	3062	68 21 38	3059
	Mars	E.	98 44 8	3223	97 18 26	3219	95 52 39	3214	94 26 47	3209
	Antares	E.	118 42 11	3071	117 13 26	3066	115 44 35	3060	114 15 37	3055
5	Aldebaran	W.	73 53 5	3006	75 23 10	3001	76 53 21	2996	78 23 38	2991
	Pollux	W.	29 55 32	3061	31 24 29	3051	32 53 38	3042	34 22 59	3032
	Spica	E.	60 55 49	3040	59 26 26	3036	57 56 58	3032	56 27 26	3028
	Mars	E.	87 16 3	3185	85 49 36	3180	84 23 3	3175	82 56 24	3169
	Antares	E.	106 49 17	3029	105 19 41	3024	103 49 59	3019	102 20 10	3014
6	Aldebaran	W.	85 56 46	2963	87 27 45	2957	88 58 51	2951	90 30 5	2946
	Pollux	W.	41 52 27	2991	43 22 51	2984	44 53 24	2976	46 24 7	2968
	Spica	E.	48 58 41	3012	47 28 44	3008	45 58 43	3005	44 28 37	3003
	Mars	E.	75 41 26	3140	74 14 5	3134	72 46 37	3128	71 19 1	3121
	Antares	E.	94 49 21	2984	93 18 49	2978	91 48 10	2972	90 17 24	2966
7	Pollux	W.	54 0 9	2930	55 31 50	2922	57 3 41	2914	58 35 42	2905
	Regulus	W.	18 12 22	2997	19 42 39	2978	21 13 19	2961	22 44 20	2946
	Spica	E.	36 57 31	2996	35 27 14	2996	33 56 56	2997	32 26 40	2999
	Mars	E.	63 58 59	3087	62 30 33	3080	61 1 59	3073	59 33 16	3065
	Antares	E.	82 41 33	2935	81 9 59	2928	79 38 16	2921	78 6 24	2914
8	Pollux	W.	66 18 24	2865	67 51 28	2856	69 24 43	2846	70 58 9	2838
	Regulus	W.	30 23 56	2882	31 56 38	2871	33 29 34	2860	35 2 44	2849
	Saturn	W.	27 11 46	2841	28 45 20	2831	30 19 7	2821	31 53 8	2811
	Mars	E.	52 7 15	3025	50 37 33	3016	49 7 40	3008	47 37 37	2999
	Antares	E.	70 24 52	2879	68 52 6	2872	67 19 10	2864	65 46 4	2856
	α Aquilæ	E.	114 28 52	3712	113 12 18	3684	111 55 14	3657	110 37 41	3632
	Sun	E.	141 3 28	3236	139 38 1	3226	138 12 23	3216	136 46 33	3206
9	Pollux	W.	78 48 17	2792	80 22 55	2782	81 57 46	2772	83 32 50	2762
	Regulus	W.	42 52 4	2796	44 26 37	2785	46 1 24	2774	47 36 25	2763

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	α Pegasi	W.	106 50 34	3531	108 10 24	3539	109 30 6	3547	110 49 39	3555
	α Arietis	W.	64 15 43	3242	65 41 2	3238	67 6 26	3235	68 31 54	3230
	Aldebaran	W.	32 23 7	3100	33 51 16	3098	35 19 28	3096	36 47 43	3094
	Regulus	E.	48 12 38	3093	46 44 20	3093	45 16 2	3095	43 47 46	3096
	Saturn	E.	51 45 33	3056	50 16 30	3057	48 47 28	3057	47 18 26	3056
	Spica	E.	102 13 54	3108	100 45 55	3107	99 17 55	3106	97 49 54	3105
2	α Arietis	W.	75 40 24	3212	77 6 19	3208	78 32 19	3204	79 58 23	3201
	Aldebaran	W.	44 9 34	3082	45 38 5	3080	47 6 39	3077	48 35 17	3074
	Regulus	E.	36 26 31	3096	34 58 17	3096	33 30 3	3097	32 1 50	3097
	Saturn	E.	39 53 5	3053	38 23 58	3052	36 54 49	3051	35 25 39	3050
	Spica	E.	90 29 31	3099	89 1 20	3097	87 33 8	3095	86 4 53	3093
3	α Arietis	W.	87 9 46	3183	88 36 16	3179	90 2 50	3176	91 29 28	3172
	Aldebaran	W.	55 59 22	3058	57 28 23	3054	58 57 29	3051	60 26 39	3047
	Saturn	E.	27 59 26	3043	26 30 7	3042	25 0 47	3042	23 31 27	3043
	Spica	E.	78 42 53	3081	77 14 20	3078	75 45 42	3075	74 17 1	3072
	Mars	E.	104 26 10	3238	103 0 46	3235	101 35 18	3231	100 9 45	3227
4	Aldebaran	W.	67 53 45	3026	69 23 26	3021	70 53 13	3016	72 23 6	3011
	Spica	E.	66 52 37	3055	65 23 32	3051	63 54 22	3048	62 25 7	3044
	Mars	E.	93 0 49	3205	91 34 46	3201	90 8 38	3196	88 42 24	3190
	Antares	E.	112 46 34	3050	111 17 24	3045	109 48 8	3040	108 18 46	3035
5	Aldebaran	W.	79 54 2	2985	81 24 33	2981	82 55 10	2975	84 25 54	2969
	Pollux	W.	35 52 32	3024	37 22 15	3015	38 52 9	3007	40 22 13	2999
	Spica	E.	54 57 50	3025	53 28 9	3021	51 58 24	3018	50 28 35	3015
	Mars	E.	81 29 38	3163	80 2 45	3158	78 35 46	3153	77 8 40	3146
	Antares	E.	100 50 14	3008	99 20 12	3002	97 50 2	2996	96 19 45	2990
6	Aldebaran	W.	92 1 26	2939	93 32 55	2933	95 4 32	2927	96 36 17	2920
	Pollux	W.	47 55 0	2960	49 26 3	2953	50 57 15	2945	52 28 37	2937
	Spica	E.	42 58 29	3001	41 28 18	2999	39 58 5	2997	38 27 49	2996
	Mars	E.	69 51 17	3114	68 23 25	3108	66 55 25	3101	65 27 16	3094
	Antares	E.	88 46 30	2960	87 15 27	2954	85 44 17	2949	84 12 59	2944
7	Pollux	W.	60 7 54	2897	61 40 16	2890	63 12 48	2881	64 45 31	2873
	Regulus	W.	24 15 41	2931	25 47 20	2918	27 19 16	2905	28 51 28	2893
	Spica	E.	30 56 26	3003	29 26 17	3008	27 56 14	3015	26 26 21	3022
	Mars	E.	58 4 23	3057	56 35 21	3049	55 6 9	3041	53 36 47	3033
	Antares	E.	76 34 24	2907	75 2 14	2900	73 29 56	2893	71 57 28	2886
8	Pollux	W.	72 31 47	2829	74 5 37	2820	75 39 38	2811	77 13 51	2801
	Regulus	W.	36 36 9	2838	38 9 47	2828	39 43 39	2817	41 17 45	2807
	Saturn	W.	33 27 22	2801	35 1 48	2791	36 36 28	2781	38 11 21	2770
	Mars	E.	46 7 23	2990	44 36 58	2981	43 6 22	2972	41 35 34	2962
	Antares	E.	64 12 49	2848	62 39 24	2841	61 5 48	2833	59 32 3	2825
	α Aquilæ	E.	109 19 41	3607	108 1 14	3584	106 42 23	3562	105 23 8	3542
	Sun	E.	135 20 31	3195	133 54 16	3185	132 27 49	3174	131 1 9	3163
9	Pollux	W.	85 8 7	2752	86 43 38	2741	88 19 23	2731	89 55 22	2720
	Regulus	W.	49 11 41	2753	50 47 11	2741	52 22 56	2730	53 58 56	2719

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^{h}.	P. L. of Diff.	VI^{h}.	P. L. of Diff.	IX^{h}.	P. L. of Diff.
9	**Saturn**	W.	39° 46′ 28″	2760	41° 21′ 48″	2750	42° 57′ 21″	2740	44° 33′ 8″	2729
	Antares	E.	57 58 6	2817	56 24 0	2809	54 49 43	2801	53 15 15	2793
	α Aquilæ	E.	104 3 31	3522	102 43 31	3504	101 23 11	3485	100 2 30	3468
	Jupiter	E.	105 57 10	2855	104 23 54	2846	102 50 26	2836	101 16 45	2825
	Sun	E.	129 34 15	3152	128 7 9	3141	126 39 49	3130	125 12 16	3119
10	Pollux	W.	91 31 35	2710	93 8 2	2698	94 44 45	2686	96 21 43	2675
	Regulus	W.	55 35 11	2707	57 11 41	2695	58 48 27	2683	60 25 29	2672
	Saturn	W.	52 35 37	2675	54 12 51	2663	55 50 21	2651	57 28 6	2640
	Antares	E.	45 20 16	2752	43 44 45	2744	42 9 5	2737	40 33 14	2730
	α Aquilæ	E.	93 14 38	3394	91 52 15	3382	90 29 38	3370	89 6 48	3359
	Jupiter	E.	93 24 54	2772	91 49 49	2760	90 14 29	2748	88 38 53	2737
	Sun	E.	117 51 3	3060	116 22 4	3047	114 52 50	3034	113 23 20	3022
11	Regulus	W.	68 34 44	2609	70 13 27	2596	71 52 27	2583	73 31 45	2570
	Saturn	W.	65 40 57	2578	67 20 22	2565	69 0 5	2553	70 40 5	2539
	Spica	W.	15 49 18	3002	17 19 28	2929	18 51 10	2866	20 24 12	2815
	Antares	E.	32 31 54	2704	30 55 20	2701	29 18 42	2700	27 42 3	2704
	Jupiter	E.	80 36 56	2675	78 59 43	2662	77 22 12	2649	75 44 24	2635
	α Aquilæ	E.	82 9 46	3317	80 45 54	3311	79 21 55	3305	77 57 50	3301
	Sun	E.	105 51 51	2956	104 20 43	2942	102 49 17	2928	101 17 33	2914
12	Regulus	W.	81 52 51	2502	83 34 1	2488	85 15 31	2474	86 57 21	2460
	Saturn	W.	79 4 44	2472	80 46 37	2458	82 28 50	2444	84 11 22	2430
	Spica	W.	28 24 14	2625	30 2 33	2598	31 41 30	2574	33 21 1	2551
	Jupiter	E.	67 30 47	2567	65 51 7	2553	64 11 8	2539	62 30 49	2525
	α Aquilæ	E.	70 56 49	3302	69 32 40	3305	68 8 35	3311	66 44 37	3320
	Sun	E.	93 34 22	2841	92 0 47	2826	90 26 53	2811	88 52 39	2796
13	Regulus	W.	95 31 28	2389	97 15 18	2375	98 59 29	2361	100 44 0	2347
	Saturn	W.	92 49 3	2359	94 33 36	2345	96 18 30	2331	98 3 44	2317
	Spica	W.	41 46 13	2447	43 28 40	2429	45 11 33	2411	46 54 52	2393
	Jupiter	E.	54 4 17	2454	52 21 59	2439	50 39 20	2425	48 56 21	2411
	α Aquilæ	E.	59 48 1	3398	58 25 42	3421	57 3 50	3450	55 42 30	3484
	Sun	E.	80 56 33	2719	79 20 19	2704	77 43 45	2689	76 6 51	2675
14	Spica	W.	55 37 33	2312	56 23 15	2296	58 9 20	2281	60 55 47	2267
	Mars	W.	24 28 0	2427	26 10 56	2412	27 54 14	2396	29 37 54	2381
	Jupiter	E.	40 16 24	2341	38 31 25	2328	36 46 7	2315	35 0 30	2303
	α Aquilæ	E.	49 6 59	3736	47 50 50	3809	46 35 57	3892	45 22 29	3967
	Sun	E.	67 57 20	2601	66 18 26	2587	64 39 13	2572	62 59 40	2559
15	Spica	W.	69 53 14	2200	71 41 42	2188	73 30 28	2176	75 19 33	2165
	Mars	W.	38 21 23	2313	40 7 3	2301	41 53 1	2289	43 39 16	2277
	Antares	W.	24 21 10	2324	26 6 34	2295	27 52 41	2269	29 39 26	2245
	Sun	E.	54 37 23	2495	52 56 3	2484	51 14 28	2474	49 32 38	2463
16	Spica	W.	84 28 54	2116	86 19 29	2108	88 10 17	2101	90 1 15	2094
	Mars	W.	52 34 36	2227	54 22 23	2219	56 10 22	2211	57 58 33	2204
	Antares	W.	38 41 3	2155	40 30 38	2143	42 20 31	2130	44 10 44	2120
	Sun	E.	41 0 4	2421	39 16 59	2415	37 33 45	2410	35 50 25	2406

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Day of the Month.	Name and Direction of Object.		Midnight.	P.L. of Diff.	XVh.	P.L. of Diff.	XVIIIh.	P.L. of Diff.	XXIh.	P.L. of Diff.
9	Saturn	W.	46° 9′ 9″	2719	47° 45′ 24″	2707	49° 21′ 54″	2697	50° 58′ 38″	2686
	Antares	E.	51 40 37	2784	50 5 48	2776	48 30 48	2768	46 55 37	2760
	α Aquilæ	E.	98 41 30	3452	97 20 13	3436	95 58 37	3421	94 36 45	3408
	Jupiter	E.	99 42 50	2815	98 8 42	2804	96 34 20	2794	94 59 44	2783
	Sun	E.	123 44 30	3108	122 16 30	3096	120 48 15	3084	119 19 46	3073
10	Pollux	W.	97 58 56	2663	99 36 25	2651	101 14 10	2640	102 52 11	2627
	Regulus	W.	62 2 47	2660	63 40 21	2647	65 18 12	2635	66 56 19	2622
	Saturn	W.	59 6 7	2628	60 44 24	2615	62 22 58	2603	64 1 49	2590
	Antares	E.	38 57 15	2723	37 21 6	2716	35 44 49	2711	34 8 24	2707
	α Aquilæ	E.	87 43 45	3349	86 20 30	3340	84 57 5	3331	83 33 30	3324
	Jupiter	E.	87 3 2	2725	85 26 55	2713	83 50 32	2700	82 13 52	2688
	Sun	E.	111 53 35	3009	110 23 34	2996	108 53 16	2983	107 22 42	2970
11	Regulus	W.	75 11 21	2557	76 51 15	2543	78 31 28	2530	80 12 0	2516
	Saturn	W.	72 20 24	2526	74 1 1	2513	75 41 56	2499	77 23 10	2485
	Spica	W.	21 58 27	2766	23 33 26	2721	25 9 38	2687	26 46 35	2657
	Antares	E.	26 5 27	2712	24 29 3	2721	22 52 52	2731	21 16 54	2743
	Jupiter	E.	74 6 17	2622	72 27 52	2609	70 49 9	2595	69 10 7	2582
	α Aquilæ	E.	76 33 42	3299	75 9 30	3298	73 45 16	3296	72 21 2	3299
	Sun	E.	99 45 32	2899	98 13 12	2885	96 40 34	2870	95 7 37	2856
12	Regulus	W.	88 39 30	2446	90 22 0	2432	92 4 49	2418	93 47 58	2403
	Saturn	W.	85 54 14	2416	87 37 26	2402	89 20 58	2388	91 4 50	2373
	Spica	W.	35 1 3	2526	36 41 37	2506	38 22 41	2486	40 4 13	2466
	Jupiter	E.	60 50 11	2511	59 9 13	2496	57 27 54	2482	55 46 16	2467
	α Aquilæ	E.	65 20 49	3330	63 57 12	3343	62 33 50	3358	61 10 46	3376
	Sun	E.	87 18 6	2781	85 43 13	2766	84 7 59	2750	82 32 26	2735
13	Regulus	W.	102 28 51	2333	103 14 2	2319	105 59 34	2305	107 45 26	2291
	Saturn	W.	99 49 19	2303	101 35 14	2289	103 21 30	2275	105 8 6	2261
	Spica	W.	48 38 36	2377	50 22 44	2359	52 7 17	2343	53 52 13	2327
	Jupiter	E.	47 13 2	2397	45 29 23	2382	43 45 23	2368	42 1 3	2355
	α Aquilæ	E.	54 21 48	3522	53 1 48	3564	51 42 35	3615	50 24 17	3671
	Sun	E.	74 29 37	2660	72 52 3	2645	71 14 8	2630	69 35 54	2615
14	Spica	W.	62 42 35	2253	64 29 44	2238	66 17 14	2224	68 5 4	2212
	Mars	W.	31 21 56	2367	33 6 18	2353	34 51 0	2339	36 36 2	2326
	Jupiter	E.	33 14 35	2290	31 28 21	2279	29 41 50	2268	27 55 3	2256
	α Aquilæ	E.	44 10 37	4095	43 0 31	4218	41 52 22	4359	40 46 24	4521
	Sun	E.	61 19 49	2545	59 39 39	2532	57 59 11	2520	56 18 26	2507
15	Spica	W.	77 8 54	2154	78 58 31	2144	80 48 24	2134	82 38 32	2124
	Mars	W.	45 25 49	2266	47 12 38	2255	48 59 43	2246	50 47 2	2236
	Antares	W.	31 26 46	2223	33 14 39	2203	35 3 2	2186	36 51 51	2170
	Sun	E.	47 50 33	2453	46 8 14	2444	44 25 42	2436	42 42 58	2428
16	Spica	W.	91 52 24	2087	93 43 43	2082	95 35 9	2077	97 26 43	2073
	Mars	W.	59 46 55	2197	61 35 27	2191	63 24 8	2186	65 12 57	2181
	Antares	W.	46 1 13	2110	47 51 56	2101	49 42 53	2094	51 34 1	2087
	Sun	E.	34 6 59	2403	32 23 29	2401	30 39 56	2401	28 56 22	2402

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LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
17	Spica	W.	99° 18′ 24″	2070	101° 10′ 9″	2068	103° 1′ 59″	2066	104° 53′ 52″	2065
	Antares	W.	53 25 20	2082	55 16 47	2077	57 8 23	2073	59 0 5	2069
	Sun	E.	27 12 50	2405	25 29 23	2411	23 46 5	2420	22 2 59	2431
20	Sun	W.	15 28 58	2637	17 7 3	2628	18 45 31	2619	20 24 9	2610
	Aldebaran	E.	81 17 44	2165	79 28 24	2178	77 39 24	2192	75 50 44	2206
	Pollux	E.	125 25 36	2180	123 36 38	2192	121 47 59	2204	119 59 38	2218
21	Sun	W.	28 36 22	2647	30 14 13	2660	31 51 46	2675	33 29 0	2690
	Aldebaran	E.	66 52 58	2284	65 6 35	2301	63 20 37	2318	61 35 3	2335
	Pollux	E.	111 3 9	2292	109 16 58	2308	107 31 10	2325	105 45 47	2341
22	Sun	W.	41 29 56	2773	43 4 59	2791	44 39 38	2810	46 13 53	2828
	α Pegasi	W.	33 20 34	4143	34 29 54	4014	35 41 20	3904	36 54 36	3810
	Aldebaran	E.	52 53 44	2426	51 10 47	2446	49 28 18	2465	47 46 16	2484
	Pollux	E.	97 5 1	2430	95 22 9	2448	93 39 42	2466	91 57 41	2484
23	Sun	W.	53 59 2	2923	55 30 51	2942	57 2 16	2961	58 33 17	2980
	α Pegasi	W.	43 21 8	3510	44 41 21	3475	46 2 13	3445	47 23 39	3418
	Aldebaran	E.	39 22 52	2583	37 43 34	2603	36 4 44	2623	34 26 21	2644
	Pollux	E.	83 34 3	2577	81 54 36	2596	80 15 35	2614	78 36 59	2632
24	Sun	W.	66 2 26	3075	67 31 6	3092	68 59 25	3110	70 27 22	3128
	α Pegasi	W.	54 16 40	3344	55 40 1	3337	57 3 30	3332	58 27 5	3329
	Pollux	E.	70 30 8	2722	68 53 57	2740	67 18 10	2757	65 42 45	2773
	Regulus	E.	106 26 22	2716	104 50 3	2732	103 14 5	2748	101 38 29	2764
25	Sun	W.	77 41 54	3211	79 7 50	3227	80 33 27	3242	81 58 46	3257
	α Pegasi	W.	65 25 29	3329	66 49 7	3332	68 12 41	3336	69 36 11	3339
	α Arietis	W.	22 28 33	3690	23 42 3	3782	24 57 24	3689	26 14 24	3614
	Pollux	E.	57 51 4	2853	56 17 45	2869	54 44 46	2884	53 12 7	2898
	Regulus	E.	93 45 43	2841	92 12 9	2856	90 38 54	2870	89 5 57	2884
	Saturn	E.	95 30 42	2809	93 56 26	2823	92 22 28	2837	90 48 48	2851
26	Sun	W.	89 1 11	3325	90 24 54	3337	91 48 23	3349	93 11 38	3359
	α Arietis	W.	32 55 6	3403	34 17 19	3380	35 40 0	3359	37 3 3	3342
	Pollux	E.	45 33 22	2967	44 2 28	2980	42 31 50	2993	41 1 28	3005
	Regulus	E.	81 25 23	2946	79 54 2	2957	78 22 56	2968	76 52 3	2979
	Saturn	E.	83 4 43	2912	81 32 40	2924	80 0 52	2935	78 29 17	2945
27	Sun	W.	100 4 53	3408	101 27 0	3417	102 48 57	3425	104 10 45	3432
	α Arietis	W.	44 2 20	3288	45 26 45	3282	46 51 17	3276	48 15 56	3272
	Pollux	E.	33 33 27	3065	32 4 35	3077	30 35 57	3090	29 7 35	3103
	Regulus	E.	69 20 45	3024	67 51 2	3031	66 21 28	3039	64 52 3	3046
	Saturn	E.	70 54 24	2989	69 23 58	2997	67 53 41	3004	66 23 33	3010
28	Sun	W.	110 57 52	3462	112 18 58	3466	113 40 0	3470	115 0 57	3474
	α Arietis	W.	55 20 21	3255	56 45 25	3253	58 10 32	3249	59 35 43	3247
	Regulus	E.	57 26 56	3074	55 58 14	3078	54 29 37	3082	53 1 5	3086
	Saturn	E.	58 54 45	3037	57 25 18	3042	55 55 57	3045	54 26 40	3047
	Spica	E.	111 26 23	3094	109 58 6	3097	108 29 53	3099	107 1 44	3102

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Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h	P. L. of Diff.	XXI^h.	P. L. of Diff.
17	Spica	W.	106° 45′ 46″	2064	108° 37′ 40″	2064	110° 29′ 35″	2065	112° 21′ 27″	2068
	Antares	W.	60 51 52	2067	62 43 42	2065	64 35 35	2064	66 27 28	2064
	Sun	E.	20 20 10	2447	18 37 42	2470	16 55 47	2504	15 14 40	2552
20	Sun	W.	22 2 50	2613	23 41 27	2618	25 19 57	2626	26 58 16	2636
	Aldebaran	E.	74 2 26	2221	72 14 30	2236	70 26 56	2251	68 39 45	2268
	Pollux	E.	118 11 38	2233	116 23 59	2247	114 36 41	2261	112 49 44	2276
21	Sun	W.	35 5 54	2705	36 42 28	2721	38 18 40	2738	39 54 29	2755
	Aldebaran	E.	59 49 55	2353	58 5 13	2371	56 20 57	2389	54 37 7	2408
	Pollux	E.	104 0 47	2358	102 16 12	2377	100 32 4	2393	98 48 19	2412
22	Sun	W.	47 47 44	2848	49 21 10	2867	50 54 11	2885	52 26 49	2904
	α Pegasi	W.	38 9 28	3729	39 25 44	3662	40 43 12	3603	42 1 43	3554
	Aldebaran	E.	46 4 41	2504	44 23 33	2523	42 42 52	2543	41 2 38	2563
	Pollux	E.	90 16 5	2503	88 34 56	2522	86 54 13	2540	85 13 55	2558
23	Sun	W.	60 3 55	3000	61 34 8	3018	63 3 58	3038	64 33 24	3057
	α Pegasi	W.	48 45 35	3398	50 7 54	3379	51 30 34	3365	52 53 30	3353
	Aldebaran	E.	32 48 26	2663	31 10 57	2683	29 33 57	2703	27 57 21	2725
	Pollux	E.	76 58 48	2651	75 21 2	2669	73 43 40	2687	72 6 42	2704
24	Sun	W.	71 54 57	3146	73 22 11	3163	74 49 5	3179	76 15 39	3195
	α Pegasi	W.	59 50 43	3326	61 14 25	3325	62 38 7	3325	64 1 49	3327
	Pollux	E.	64 7 42	2790	62 33 1	2806	60 58 41	2822	59 24 42	2838
	Regulus	E.	100 3 14	2781	98 28 21	2796	96 53 48	2812	95 19 36	2827
25	Sun	W.	83 23 48	3271	84 48 33	3285	86 13 1	3299	87 37 14	3313
	α Pegasi	W.	70 59 37	3345	72 22 56	3350	73 46 10	3355	75 9 18	3361
	α Arietis	W.	27 32 43	3554	28 52 7	3507	30 12 23	3466	31 33 25	3432
	Pollux	E.	51 39 46	2913	50 7 44	2927	48 35 59	2941	47 4 32	2954
	Regulus	E.	87 33 17	2897	86 0 54	2910	84 28 48	2923	82 56 58	2935
	Saturn	E.	89 15 27	2864	87 42 22	2876	86 9 33	2889	84 37 0	2901
26	Sun	W.	94 34 41	3371	95 57 31	3381	97 20 9	3391	98 42 36	3400
	α Arietis	W.	38 26 26	3328	39 50 5	3315	41 13 59	3306	42 38 4	3296
	Pollux	E.	39 31 22	3017	38 1 30	3030	36 31 54	3042	35 2 33	3054
	Regulus	E.	75 21 24	2989	73 50 57	2998	72 20 42	3007	70 50 38	3016
	Saturn	E.	76 57 55	2954	75 26 45	2964	73 55 47	2974	72 25 0	2982
27	Sun	W.	105 32 25	3439	106 53 57	3446	108 15 22	3452	109 36 40	3457
	α Arietis	W.	49 40 40	3268	51 5 29	3264	52 30 22	3260	53 55 20	3258
	Pollux	E.	27 39 29	3115	26 11 38	3129	24 44 4	3145	23 16 49	3163
	Regulus	E.	63 22 47	3052	61 53 39	3058	60 24 38	3064	58 55 44	3069
	Saturn	E.	64 53 33	3017	63 23 41	3022	61 53 56	3027	60 24 17	3033
28	Sun	W.	116 21 50	3477	117 42 40	3480	119 3 26	3482	120 24 10	3485
	α Arietis	W.	61 0 57	3244	62 26 14	3241	63 51 34	3239	65 16 57	3236
	Regulus	E.	51 32 38	3088	50 4 14	3091	48 35 53	3093	47 7 35	3096
	Saturn	E.	52 57 26	3051	51 28 16	3053	49 59 9	3056	48 30 4	3056
	Spica	E.	105 33 37	3104	104 5 33	3106	102 37 31	3107	101 9 30	3108

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Sat.	1	22 49 30.89	9.355	S. 7 28 55.7	+57.03	16 10.38	65.41	12 30.89	0.500
SUN.	2	22 53 15.13	9.334	7 6 3.6	57.29	16 10.14	65.34	12 18.61	0.521
Mon.	3	22 56 58.86	9.313	6 43 5.7	57.53	16 9.89	65.27	12 5.83	0.542
Tues.	4	23 0 42.12	9 294	6 20 2.2	+57.75	16 9.65	65.20	11 52.57	0.561
Wed.	5	23 4 24.92	9.275	5 56 53.6	57.96	16 9.40	65.14	11 38.85	0.580
Thur.	6	23 8 7.29	9.257	5 33 40.2	58.15	16 9.15	65.08	11 24.70	0.597
Frid.	7	23 11 49.25	9.240	5 10 22.4	+58.33	16 8.89	65.02	11 10.15	0.614
Sat.	8	23 15 30.83	9.225	4 47 0.5	58.49	16 8.63	64.96	10 55.22	0.629
SUN.	9	23 19 12.04	9.210	4 23 34.8	58.64	16 8.36	64.91	10 39.91	0.644
Mon.	10	23 22 52.91	9.197	4 0 5.8	+58.77	16 8.09	64.86	10 24.27	0.657
Tues.	11	23 26 33.47	9.184	3 36 33.9	58.89	16 7.82	64.82	10 8.32	0.670
Wed.	12	23 30 13.74	9.172	3 12 59.3	58.99	16 7.55	64.77	9 52.08	0.682
Thur.	13	23 33 53.72	9.161	2 49 22.4	+59.08	16 7.28	64.73	9 35.55	0.693
Frid.	14	23 37 33.45	9.151	2 25 43.5	59.15	16 7.01	64.69	9 18.77	0.703
Sat.	15	23 41 12.95	9.141	2 2 3.2	59.21	16 6.73	64.65	9 1.77	0.713
SUN.	16	23 44 52.24	9.133	1 38 21.7	+59.25	16 6.46	64.62	8 44.55	0.721
Mon.	17	23 48 31.33	9.125	1 14 39.4	59.28	16 6.18	64.59	8 27.14	0.729
Tues.	18	23 52 10.24	9.118	0 50 56.6	59.29	16 5.91	64.56	8 9.54	0.736
Wed.	19	23 55 48.99	9.112	0 27 13.8	+59.28	16 5.63	64.54	7 51.79	0.742
Thur.	20	23 59 27.60	9.106	S. 0 3 31.3	59.26	16 5.36	64.52	7 33.90	0.748
Frid.	21	0 3 6.08	9.101	N. 0 20 10.5	59.22	16 5.08	64.50	7 15.88	0.753
Sat.	22	0 6 44.45	9.097	0 43 51.2	+59.17	16 4.81	64.49	6 57.75	0.757
SUN.	23	0 10 22.74	9.093	1 7 30.4	59.10	16 4.53	64.48	6 39.53	0.761
Mon.	24	0 14 0.95	9.091	1 31 7.8	59.01	16 4.26	64.48	6 21.23	0.763
Tues.	25	0 17 39.10	9.089	1 54 42.9	+58.91	16 3.99	64.47	6 2.87	0.765
Wed.	26	0 21 17.21	9.088	2 18 15.4	58.79	16 3.72	64.47	5 44.48	0.766
Thur.	27	0 24 55.29	9.087	2 41 44.9	58.66	16 3.44	64.47	5 26.06	0.767
Frid.	28	0 28 33.36	9.087	3 5 11.0	+58.51	16 3.17	64.47	5 7.64	0.767
Sat.	29	0 32 11.46	9.088	3 28 33.4	58.35	16 2.90	64.48	4 49.24	0.766
SUN.	30	0 35 49.60	9.090	3 51 51.8	58.17	16 2.63	64.49	4 30.87	0.764
Mon.	31	0 39 27.79	9.093	4 15 5.7	57.98	16 2.35	64.50	4 12.55	0.762
Tues.	32	0 43 6.06	9.096	N. 4 38 14.8	+57.78	16 2.08	64.51	3 54.32	0.758

NOTE.—The mean time of semidiameter passing may be found by subtracting 0ˢ.18 from the sidereal time.
The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing; north declinations, increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Sat.	1	22 49 28.94	9.356	S. 7 29 7.6	+57.04	12 30.99	0.500	22 36 57.95
SUN.	2	22 53 13.21	9.335	7 6 15.4	57.30	12 18.71	0.521	22 40 54.50
Mon.	3	22 56 56.98	9.314	6 43 17.3	57.54	12 5.93	0.542	22 44 51.06
Tues.	4	23 0 40.28	9.295	6 20 13.7	+57.76	11 52.67	0.561	22 48 47.61
Wed.	5	23 4 23.12	9.276	5 57 4.9	57.97	11 38.95	0.580	22 52 44.17
Thur.	6	23 8 5.53	9.259	5 33 51.3	58.16	11 24.81	0.597	22 56 40.72
Frid.	7	23 11 47.53	9.242	5 10 33.3	+58.34	11 10.26	0.614	23 0 37.27
Sat.	8	23 15 29.15	9.227	4 47 11.2	58.50	10 55.33	0.629	23 4 33.82
SUN.	9	23 19 10.40	9.212	4 23 45.3	58.65	10 40.02	0.644	23 8 30.38
Mon.	10	23 22 51.31	9.199	4 0 16.1	+58.78	10 24.38	0.657	23 12 26.93
Tues.	11	23 26 31.91	9.186	3 36 43.9	58.90	10 8.43	0.670	23 16 23.48
Wed.	12	23 30 12.22	9.174	3 13 9.1	59.00	9 52.19	0.682	23 20 20.03
Thur.	13	23 33 52.25	9.163	2 49 31.9	+59.09	9 35.66	0.693	23 24 16.59
Frid.	14	23 37 32.02	9.153	2 25 52.8	59.16	9 18.88	0.703	23 28 13.14
Sat.	15	23 41 11.57	9.144	2 2 12.2	59.22	9 1.88	0.713	23 32 9.69
SUN.	16	23 44 50.90	9.135	1 38 30.4	+59.26	8 44.66	0.721	23 36 6.24
Mon.	17	23 48 30.04	9.127	1 14 47.8	59.29	8 27.24	0.729	23 40 2.80
Tues.	18	23 52 8.99	9.120	0 51 4.7	59.30	8 9.64	0.736	23 43 59.35
Wed.	19	23 55 47.79	9.114	0 27 21.6	+59.29	7 51.89	0.742	23 47 55.90
Thur.	20	23 59 26.45	9.108	S. 0 3 38.8	59.27	7 34.00	0.748	23 51 52.45
Frid.	21	0 3 4.98	9.103	N. 0 20 3.3	59.23	7 15.97	0.753	23 55 49.01
Sat.	22	0 6 43.40	9.099	0 43 44.3	+59.18	6 57.84	0.757	23 59 45.56
SUN.	23	0 10 21.73	9.095	1 7 23.8	59.11	6 39.61	0.761	0 3 42.12
Mon.	24	0 13 59.98	9.093	1 31 1.5	59.02	6 21.31	0.763	0 7 38.67
Tues.	25	0 17 38.17	9.091	1 54 37.0	+58.92	6 2.95	0.765	0 11 35.22
Wed.	26	0 21 16.33	9.090	2 18 9.8	58.80	5 44.56	0.766	0 15 31.77
Thur.	27	0 24 54.46	9.089	2 41 39.6	58.67	5 26.13	0.767	0 19 28.33
Frid.	28	0 28 32.58	9.089	3 5 6.0	+58.52	5 7.70	0.767	0 23 24.88
Sat.	29	0 32 10.73	9.090	3 28 28.7	58.36	4 49.30	0.766	0 27 21.43
SUN.	30	0 35 48.91	9.092	3 51 47.4	58.18	4 30.93	0.764	0 31 17.98
Mon.	31	0 39 27.15	9.094	4 15 1.6	57.99	4 12.61	0.762	0 35 14 54
Tues.	32	0 43 5.46	9.098	N. 4 38 11.0	+57.79	3 54.37	0.758	0 39 11.09

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing; north declinations, increasing.

Diff. for 1 Hour, $+9^s.8565$. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ′	Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	60	340 53 58.3	54 6.6	150.37	+ 0.35	9.9962348	+44.6	1 22 48.45
2	61	341 54 6.2	54 14.4	150.29	0.48	9.9963425	45.2	1 18 52.54
3	62	342 54 12.1	54 20.2	150.20	0.60	9.9964517	45.8	1 14 56.63
4	63	343 54 16.0	54 24.0	150.12	+ 0.69	9.9965624	+46.4	1 11 0.72
5	64	344 54 17.9	54 25.8	150.04	0.76	9.9966745	47.0	1 7 4.82
6	65	345 54 17.9	54 25.7	149.96	0.81	9.9967882	47.6	1 3 8.92
7	66	346 54 16.0	54 23.7	149.88	+ 0.82	9.9969034	+48.3	0 59 13.01
8	67	347 54 12.3	54 19.9	149.80	0.80	9.9970201	48.9	0 55 17.10
9	68	348 54 6.8	54 14.3	149.73	0.75	9.9971381	49.4	0 51 21.19
10	69	349 53 59.5	54 6.9	149.65	+ 0.67	9.9972574	+49.9	0 47 25.28
11	70	350 53 50.4	53 57.7	149.58	0.57	9.9973779	50.4	0 43 29.37
12	71	351 53 39.6	53 46.8	149.51	0.45	9.9974994	50.8	0 39 33.46
13	72	352 53 27.2	53 34.3	149.45	+ 0.32	9.9976217	+51.1	0 35 37.56
14	73	353 53 13.2	53 20.2	149.38	0.19	9.9977447	51.3	0 31 41.65
15	74	354 52 57.4	53 4.3	149.31	+ 0.06	9.9978682	51.5	0 27 45.74
16	75	355 52 39.9	52 46.7	149.24	− 0.06	9.9979921	+51.6	0 23 49.83
17	76	356 52 20.6	52 27.3	149.16	0.17	9.9981162	51.7	0 19 53.93
18	77	357 51 59.6	52 6.2	149.08	0.26	9.9982403	51.7	0 15 58.02
19	78	358 51 36.7	51 43.2	149.00	− 0.32	9.9983644	+51.7	0 12 2.12
20	79	359 51 11.8	51 18.2	148.92	0.35	9.9984883	51.6	0 8 6.22
21	80	0 50 44.9	50 51.2	148.83	0.36	9.9986120	51.5	0 4 10.31
22	81	1 50 16.0	50 22.2	148.75	− 0.34	9.9987355	+51.4	0 0 14.40 23 56 18.49
23	82	2 49 44.9	49 51.0	148.66	0.28	9.9988586	51.2	23 52 22.58
24	83	3 49 11.6	49 17.6	148.57	0.19	9.9989814	51.1	23 48 26.68
25	84	4 48 36.1	48 42.0	148.48	− 0.07	9.9991041	+51.1	23 44 30.77
26	85	5 47 58 3	48 4.1	148.38	+ 0.05	9.9992266	51.0	23 40 34.86
27	86	6 47 18.2	47 23.9	148.28	0.18	9.9993490	51.0	23 36 38.95
28	87	7 46 35.7	46 41.3	148.18	+ 0.31	9.9994713	+51.0	23 32 43.05
29	88	8 45 50.9	45 56.4	148.08	0.44	9.9995938	51.1	23 28 47.14
30	89	9 45 3.8	45 9.2	147.98	0.55	9.9997165	51.2	23 24 51.23
31	90	10 44 14.3	44 19.7	147.89	0.65	9.9998394	51.3	23 20 55.33
32	91	11 43 22.6	43 27.9	147.80	+ 0.73	9.9999626	+51.4	23 16 59.42

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January 0^d.0.

Diff. for 1 Hour,
—9^s.8296.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 46.7	14 46.2	54 7.1	−0.23	54 5.5	−0.05	8 35.5	2.05	10.1
2	14 46.3	14 47.0	54 5.9	+0.13	54 8.5	+0.29	9 24.5	2.02	11.1
3	14 48.2	14 49.9	54 12.9	0.43	54 18.9	0.57	10 12.6	1.97	12.1
4	14 51.9	14 54.4	54 26.5	+0.69	54 35.5	+0.80	10 59.3	1.92	13.1
5	14 57.1	15 0.2	54 45.6	0.88	54 56.7	0.96	11 44.8	1.87	14.1
6	15 3.4	15 6.9	55 8.7	1.03	55 21.3	1.08	12 29.2	1.84	15.1
7	15 10.4	15 14.2	55 34.5	+1.12	55 48.2	+1.16	13 13.0	1.83	16.1
8	15 18.0	15 21.9	56 2.3	1.19	56 16.7	1.21	13 57.1	1.86	17.1
9	15 25.9	15 30.0	56 31.3	1.23	56 46.2	1.25	14 42.3	1.92	18.1
10	15 34.1	15 38.2	57 1.2	+1.26	57 16.4	+1.28	15 29.4	2.02	19.1
11	15 42.4	15 46.6	57 31.8	1.28	57 47.2	1.29	16 19.4	2.14	20.1
12	15 50.8	15 55.0	58 2.7	1.29	58 18.1	1.28	17 13.1	2.28	21.1
13	15 59.1	16 3.2	58 33.3	+1.26	58 48.2	+1.22	18 10.2	2.42	22.1
14	16 7.1	16 10.8	59 2.6	1.17	59 16.2	1.09	19 9.9	2.52	23.1
15	16 14.2	16 17.2	59 28.7	0.98	59 39.7	0.85	20 11.0	2.53	24.1
16	16 19.8	16 21.8	59 49.1	+0.70	59 56.4	+0.50	21 11.4	2.47	25.1
17	16 23.1	16 23.7	60 1.2	+0.28	60 3.4	+0.05	22 9.6	2.36	26.1
18	16 23.4	16 22.4	60 2.6	−0.20	59 58.6	−0.46	23 4.8	2.24	27.1
19	16 20.4	16 17.6	59 51.5	−0.73	59 41.1	−0.99	23 57.0	2.13	28.1
20	16 14.0	16 9.6	59 27.8	1.23	59 11.6	1.44	☌		29.1
21	16 4.5	15 58.9	58 53.0	1.64	58 32.3	1.79	0 46.9	2.05	0.6
22	15 52.8	15 46.4	58 10.0	−1.90	57 46.7	−1.97	1 35.5	2.01	1.6
23	15 39.9	15 33.3	57 22.7	2.01	56 58.6	1.98	2 23.2	1.99	2.6
24	15 26.9	15 20.7	56 35.0	1.94	56 12.2	1.85	3 11.1	2.01	3.6
25	15 14.8	15 9.4	55 50.6	−1.73	55 30.5	−1.59	3 59.6	2.06	4.6
26	15 4.4	15 0.1	55 12.4	1.42	54 56.5	1.23	4 48.9	2.06	5.6
27	14 56.4	14 53.3	54 42.8	1.04	54 31.6	0.83	5 38.6	2.07	6.6
28	14 51.0	14 49.3	54 22.9	−0.61	54 16.9	−0.40	6 28.5	2.07	7.6
29	14 48.4	14 48.1	54 13.4	−0.18	54 12.5	+0.03	7 18.0	2.04	8.6
30	14 48.6	14 49.7	54 14.2	+0.24	54 18.2	0.43	8 6.4	1.99	9.6
31	14 51.4	14 53.7	54 24.6	0.62	54 33.0	0.78	8 53.6	1.94	10 6
32	14 56.5	14 59.8	54 43.4	+0.94	54 55.5	+1.07	9 39.4	1.89	11.6

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	6 55 25.32	2.1542	N.23 54 57.4	0.365
1	6 57 34.57	2.1539	23 54 38.1	0.377
2	6 59 43.79	2.1535	23 54 12.1	0.490
3	7 1 52.99	2.1532	23 53 39.3	0.603
4	7 4 2.17	2.1527	23 52 59.7	0.716
5	7 6 11.32	2.1522	23 52 13.4	0.828
6	7 8 20.44	2.1517	23 51 20.4	0.940
7	7 10 29.53	2.1512	23 50 20.6	1.052
8	7 12 38.59	2.1507	23 49 14.1	1.164
9	7 14 47.61	2.1501	23 48 0.9	1.276
10	7 16 56.60	2.1494	23 46 41.0	1.388
11	7 19 5.54	2.1487	23 45 14.3	1.501
12	7 21 14.44	2.1479	23 43 40.9	1.612
13	7 23 23.29	2.1472	23 42 0.8	1.724
14	7 25 32.10	2.1464	23 40 14.0	1.835
15	7 27 40.86	2.1455	23 38 20.6	1.946
16	7 29 49.56	2.1446	23 36 20.5	2.057
17	7 31 58.21	2.1437	23 34 13.8	2.167
18	7 34 6.80	2.1427	23 32 0.4	2.278
19	7 36 15.33	2.1417	23 29 40.4	2.388
20	7 38 23.80	2.1407	23 27 13.8	2.499
21	7 40 32.21	2.1396	23 24 40.5	2.610
22	7 42 40.55	2.1384	23 22 0.6	2.719
23	7 44 48.82	2.1373	N.23 19 14.2	2.828

SUNDAY 2.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	7 46 57.02	2.1361	N.23 16 21.2	2.938
1	7 49 5.15	2.1348	23 13 21.6	3.047
2	7 51 13.20	2.1336	23 10 15.5	3.156
3	7 53 21.18	2.1323	23 7 2.9	3.264
4	7 55 29.08	2.1310	23 3 43.8	3.373
5	7 57 36.90	2.1296	23 0 18.2	3.481
6	7 59 44.63	2.1282	22 56 46.1	3.588
7	8 1 52.28	2.1267	22 53 7.6	3.696
8	8 3 59.84	2.1253	22 49 22.6	3.803
9	8 6 7.32	2.1239	22 45 31.2	3.910
10	8 8 14.71	2.1223	22 41 33.4	4.016
11	8 10 22.00	2.1206	22 37 29.3	4.122
12	8 12 29.19	2.1190	22 33 18.8	4.227
13	8 14 36.29	2.1175	22 29 2.0	4.332
14	8 16 43.29	2.1159	22 24 38.9	4.438
15	8 18 50.20	2.1142	22 20 9.4	4.543
16	8 20 57.00	2.1125	22 15 33.7	4.648
17	8 23 3.70	2.1108	22 10 51.7	4.752
18	8 25 10.30	2.1091	22 6 3.5	4.855
19	8 27 16.79	2.1073	22 1 9.1	4.958
20	8 29 23.17	2.1054	21 56 8.5	5.061
21	8 31 29.44	2.1036	21 51 1.8	5.164
22	8 33 35.61	2.1018	21 45 48.9	5.266
23	8 35 41.66	2.0999	21 40 29.9	5.367
24	8 37 47.60	2.0981	N.21 35 4.9	5.467

MONDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	8 37 47.60	2.0981	N.21 35 4.9	5.467
1	8 39 53.43	2.0962	21 29 33.8	5.568
2	8 41 59.14	2.0942	21 23 56.7	5.668
3	8 44 4.73	2.0922	21 18 13.6	5.768
4	8 46 10.21	2.0903	21 12 24.5	5.867
5	8 48 15.57	2.0883	21 6 29.5	5.967
6	8 50 20.81	2.0863	21 0 28.5	6.066
7	8 52 25.93	2.0843	20 54 21.6	6.163
8	8 54 30.93	2.0822	20 48 8.9	6.260
9	8 56 35.80	2.0802	20 41 50.4	6.357
10	8 58 40.55	2.0782	20 35 26.1	6.453
11	9 0 45.18	2.0761	20 28 56.1	6.548
12	9 2 49.68	2.0740	20 22 20.3	6.644
13	9 4 54.06	2.0719	20 15 38.8	6.739
14	9 6 58.31	2.0698	20 8 51.6	6.834
15	9 9 2.44	2.0677	20 1 58.7	6.928
16	9 11 6.44	2.0656	19 55 0.2	7.021
17	9 13 10.31	2.0634	19 47 56.2	7.113
18	9 15 14.05	2.0612	19 40 46.7	7.205
19	9 17 17.66	2.0591	19 33 31.6	7.297
20	9 19 21.14	2.0569	19 26 11.0	7.388
21	9 21 24.49	2.0548	19 18 45.0	7.478
22	9 23 27.72	2.0527	19 11 13.6	7.568
23	9 25 30.82	2.0506	N.19 3 36.8	7.658

TUESDAY 4.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	9 27 33.79	2.0484	N.18 55 54.6	7.747
1	9 29 36.63	2.0462	18 48 7.1	7.835
2	9 31 39.34	2.0440	18 40 14.4	7.923
3	9 33 41.91	2.0418	18 32 16.4	8.010
4	9 35 44.35	2.0397	18 24 13.2	8.096
5	9 37 46.67	2.0376	18 16 4.9	8.182
6	9 39 48.86	2.0354	18 7 51.4	8.267
7	9 41 50.92	2.0332	17 59 32.8	8.352
8	9 43 52.85	2.0311	17 51 9.2	8.436
9	9 45 54.65	2.0289	17 42 40.5	8.519
10	9 47 56.32	2.0268	17 34 6.9	8.602
11	9 49 57.86	2.0247	17 25 28.3	8.684
12	9 51 59.28	2.0226	17 16 44.8	8.765
13	9 54 0.57	2.0204	17 7 56.5	8.846
14	9 56 1.73	2.0183	16 59 3.3	8.927
15	9 58 2.76	2.0162	16 50 5.3	9.006
16	10 0 3.67	2.0142	16 41 2.6	9.084
17	10 2 4.46	2.0121	16 31 55.2	9.162
18	10 4 5.12	2.0100	16 22 43.1	9.240
19	10 6 5.66	2.0080	16 13 26.4	9.317
20	10 8 6.08	2.0059	16 4 5.1	9.393
21	10 10 6.37	2.0038	15 54 39.2	9.469
22	10 12 6.54	2.0019	15 45 8.8	9.543
23	10 14 6.60	2.0000	15 35 34.0	9.617
24	10 16 6.54	1.9980	N.15 25 54.7	9.691

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 5.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
	h m s	s	° ′ ″	″
0	10 16 6.54	1.9980	N.15 25 54.7	9.691
1	10 18 6.36	1.9960	15 16 11.0	9.764
2	10 20 6.06	1.9941	15 6 23.0	9.835
3	10 22 5.65	1.9922	14 56 30.8	9.906
4	10 24 5.12	1.9903	14 46 34.3	9.977
5	10 26 4.48	1.9884	14 36 33.5	10.048
6	10 28 3.73	1.9866	14 26 28.5	10.117
7	10 30 2.87	1.9847	14 16 19.4	10.185
8	10 32 1.90	1.9829	14 6 6.3	10.253
9	10 34 0.82	1.9812	13 55 49.1	10.320
10	10 35 59.64	1.9795	13 45 27.9	10.386
11	10 37 58.36	1.9777	13 35 2.8	10.452
12	10 39 56.97	1.9760	13 24 33.7	10.516
13	10 41 55.48	1.9743	13 14 0.8	10.580
14	10 43 53.89	1.9727	13 3 24.1	10.644
15	10 45 52.20	1.9711	12 52 43.5	10.707
16	10 47 50.42	1.9695	12 41 59.2	10.769
17	10 49 48.54	1.9679	12 31 11.2	10.830
18	10 51 46.57	1.9664	12 20 19.6	10.890
19	10 53 44.51	1.9649	12 9 24.4	10.950
20	10 55 42.36	1.9634	11 58 25.6	11.009
21	10 57 40.12	1.9620	11 47 23.3	11.067
22	10 59 37.80	1.9606	11 36 17.6	11.124
23	11 1 35.39	1.9592	N.11 25 8.4	11.181

THURSDAY 6.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
0	11 3 32.90	1.9579	N.11 13 55.8	11.237
1	11 5 30.33	1.9566	11 2 39.9	11.292
2	11 7 27.69	1.9553	10 51 20.8	11.346
3	11 9 24.97	1.9541	10 39 58.4	11.400
4	11 11 22.18	1.9529	10 28 32.8	11.452
5	11 13 19.32	1.9517	10 17 4.1	11.504
6	11 15 16.39	1.9506	10 5 32.3	11.556
7	11 17 13.39	1.9495	9 53 57.4	11.607
8	11 19 10.33	1.9485	9 42 19.5	11.656
9	11 21 7.21	1.9475	9 30 38.7	11.704
10	11 23 4.03	1.9465	9 18 55.0	11.751
11	11 25 0.79	1.9456	9 7 8.5	11.798
12	11 26 57.50	1.9447	8 55 19.2	11.845
13	11 28 54.15	1.9438	8 43 27.1	11.891
14	11 30 50.75	1.9430	8 31 32.3	11.936
15	11 32 47.31	1.9423	8 19 34.8	11.980
16	11 34 43.83	1.9417	8 7 34.7	12.023
17	11 36 40.31	1.9410	7 55 32.0	12.066
18	11 38 36.75	1.9403	7 43 26.8	12.107
19	11 40 33.15	1.9397	7 31 19.2	12.147
20	11 42 29.52	1.9391	7 19 9.1	12.187
21	11 44 25.85	1.9386	7 6 56.7	12.226
22	11 46 22.15	1.9382	6 54 42.0	12.264
23	11 48 18.43	1.9377	6 42 25.0	12.302
24	11 50 14.68	1.9374	N. 6 30 5.7	12.339

FRIDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	11 50 14.68	1.9374	N. 6 30 5.7	12.339
1	11 52 10.91	1.9371	6 17 44.3	12.374
2	11 54 7.13	1.9368	6 5 20.8	12.409
3	11 56 3.33	1.9366	5 52 55.2	12.443
4	11 57 59.52	1.9364	5 40 27.6	12.476
5	11 59 55.70	1.9363	5 27 58.1	12.507
6	12 1 51.88	1.9362	5 15 26.7	12.538
7	12 3 48.05	1.9362	5 2 53.5	12.569
8	12 5 44.22	1.9363	4 50 18.4	12.600
9	12 7 40.40	1.9364	4 37 41.5	12.629
10	12 9 36.59	1.9365	4 25 2.9	12.657
11	12 11 32.78	1.9366	4 12 22.7	12.683
12	12 13 28.98	1.9368	3 59 40.9	12.709
13	12 15 25.20	1.9371	3 46 57.6	12.735
14	12 17 21.44	1.9374	3 34 12.7	12.760
15	12 19 17.69	1.9377	3 21 26.4	12.783
16	12 21 13.97	1.9382	3 8 38.7	12.806
17	12 23 10.28	1.9387	2 55 49.7	12.827
18	12 25 6.62	1.9392	2 42 59.5	12.847
19	12 27 2.99	1.9398	2 30 8.1	12.867
20	12 28 59.40	1.9405	2 17 15.4	12.887
21	12 30 55.85	1.9412	2 4 21.6	12.906
22	12 32 52.34	1.9419	1 51 26.7	12.923
23	12 34 48.88	1.9427	N. 1 38 30.8	12.939

SATURDAY 8.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	12 36 45.47	1.9436	N. 1 25 34.0	12.954
1	12 38 42.11	1.9445	1 12 36.3	12.969
2	12 40 38.81	1.9455	0 59 37.7	12.983
3	12 42 35.57	1.9466	0 46 38.3	12.996
4	12 44 32.40	1.9477	0 33 38.2	13.007
5	12 46 29.29	1.9488	0 20 37.4	13.017
6	12 48 26.25	1.9500	N. 0 7 36.1	13.027
7	12 50 23.29	1.9512	S. 0 5 25.8	13.037
8	12 52 20.40	1.9525	0 18 28.3	13.045
9	12 54 17.59	1.9539	0 31 31.2	13.052
10	12 56 14.87	1.9553	0 44 34.5	13.058
11	12 58 12.23	1.9567	0 57 38.1	13.063
12	13 0 9.68	1.9583	1 10 42.1	13.068
13	13 2 7.23	1.9600	1 23 46.3	13.071
14	13 4 4.88	1.9616	1 36 50.6	13.073
15	13 6 2.62	1.9633	1 49 55.0	13.074
16	13 8 0.47	1.9651	2 2 59.5	13.075
17	13 9 58.43	1.9670	2 16 4.0	13.074
18	13 11 56.51	1.9689	2 29 8.4	13.072
19	13 13 54.70	1.9708	2 42 12.7	13.070
20	13 15 53.01	1.9727	2 55 16.8	13.066
21	13 17 51.43	1.9748	3 8 20.6	13.061
22	13 19 49.98	1.9770	3 21 24.1	13.056
23	13 21 48.67	1.9792	3 34 27.3	13.050
24	13 23 47.49	1.9814	S. 3 47 30.1	13.042

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	13 23 47.49	1.9814	S. 3 47 30.1	13.042
1	13 25 46.44	1.9837	4 0 32.4	13.033
2	13 27 45.53	1.9861	4 13 34.1	13.023
3	13 29 44.77	1.9885	4 26 35.2	13.013
4	13 31 44.15	1.9910	4 39 35.7	13.002
5	13 33 43.69	1.9936	4 52 35.4	12.989
6	13 35 43.38	1.9962	5 5 34.3	12.975
7	13 37 43.23	1.9988	5 18 32.4	12.961
8	13 39 43.24	2.0015	5 31 29.6	12.944
9	13 41 43.41	2.0043	5 44 25.7	12.927
10	13 43 43.75	2.0072	5 57 20.8	12.909
11	13 45 44.27	2.0101	6 10 14.8	12.890
12	13 47 44.96	2.0130	6 23 7.6	12.870
13	13 49 45.83	2.0160	6 35 59.2	12.849
14	13 51 46.88	2.0191	6 48 49.5	12.827
15	13 53 48.12	2.0222	7 1 38.4	12.803
16	13 55 49.55	2.0254	7 14 25.9	12.779
17	13 57 51.17	2.0287	7 27 11.9	12.754
18	13 59 52.99	2.0320	7 39 56.4	12.727
19	14 1 55.01	2.0354	7 52 39.2	12.699
20	14 3 57.24	2.0388	8 5 20.3	12.671
21	14 5 59.67	2.0422	8 17 59.7	12.642
22	14 8 2.31	2.0458	8 30 37.3	12.611
23	14 10 5.17	2.0495	S. 8 43 13.0	12.578

MONDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	14 12 8.25	2.0532	S. 8 55 46.7	12.545
1	14 14 11.55	2.0569	9 8 18.4	12.511
2	14 16 15.08	2.0606	9 20 48.0	12.475
3	14 18 18.83	2.0644	9 33 15.4	12.438
4	14 20 22.81	2.0683	9 45 40.6	12.401
5	14 22 27.03	2.0723	9 58 3.5	12.362
6	14 24 31.49	2.0763	10 10 24.0	12.322
7	14 26 36.19	2.0804	10 22 42.1	12.281
8	14 28 41.14	2.0845	10 34 57.7	12.238
9	14 30 46.33	2.0886	10 47 10.7	12.195
10	14 32 51.77	2.0928	10 59 21.1	12.150
11	14 34 57.47	2.0971	11 11 28.7	12.104
12	14 37 3.43	2.1015	11 23 33.5	12.057
13	14 39 9.65	2.1058	11 35 35.5	12.009
14	14 41 16.13	2.1102	11 47 34.6	11.960
15	14 43 22.88	2.1147	11 59 30.7	11.908
16	14 45 29.90	2.1193	12 11 23.6	11.856
17	14 47 37.20	2.1239	12 23 13.4	11.803
18	14 49 44.77	2.1285	12 35 0.0	11.750
19	14 51 52.62	2.1332	12 46 43.4	11.694
20	14 54 0.75	2.1379	12 58 23.3	11.636
21	14 56 9.17	2.1427	13 9 59.7	11.578
22	14 58 17.87	2.1475	13 21 32.6	11.519
23	15 0 26.87	2.1524	13 33 2.0	11.459
24	15 2 36.16	2.1573	S. 13 44 27.7	11.397

TUESDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	15 2 36.16	2.1573	S. 13 44 27.7	11.397
1	15 4 45.75	2.1623	13 55 49.7	11.334
2	15 6 55.64	2.1673	14 7 7.8	11.269
3	15 9 5.83	2.1723	14 18 22.0	11.204
4	15 11 16.32	2.1773	14 29 32.3	11.137
5	15 13 27.11	2.1824	14 40 38.5	11.069
6	15 15 38.21	2.1876	14 51 40.6	11.000
7	15 17 49.63	2.1929	15 2 38.5	10.929
8	15 20 1.36	2.1981	15 13 32.1	10.857
9	15 22 13.40	2.2033	15 24 21.4	10.784
10	15 24 25.76	2.2087	15 35 6.2	10.709
11	15 26 38.44	2.2141	15 45 46.5	10.633
12	15 28 51.45	2.2195	15 56 22.2	10.557
13	15 31 4.78	2.2249	16 6 53.3	10.478
14	15 33 18.44	2.2303	16 17 19.6	10.398
15	15 35 32.42	2.2357	16 27 41.1	10.317
16	15 37 46.73	2.2412	16 37 57.7	10.235
17	15 40 1.37	2.2467	16 48 9.3	10.151
18	15 42 16.34	2.2522	16 58 15.8	10.066
19	15 44 31.64	2.2578	17 8 17.2	9.980
20	15 46 47.28	2.2635	17 18 13.4	9.892
21	15 49 3.26	2.2691	17 28 4.3	9.803
22	15 51 19.58	2.2747	17 37 49.8	9.713
23	15 53 36.23	2.2803	S. 17 47 29.9	9.622

WEDNESDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	15 55 53.22	2.2860	S. 17 57 4.4	9.528
1	15 58 10.55	2.2917	18 6 33.3	9.434
2	16 0 28.22	2.2974	18 15 56.5	9.339
3	16 2 46.24	2.3031	18 25 14.0	9.242
4	16 5 4.60	2.3088	18 34 25.6	9.144
5	16 7 23.30	2.3145	18 43 31.3	9.045
6	16 9 42.34	2.3202	18 52 31.0	8.944
7	16 12 1.73	2.3260	19 1 24.6	8.842
8	16 14 21.46	2.3317	19 10 12.0	8.738
9	16 16 41.53	2.3374	19 18 53.1	8.633
10	16 19 1.95	2.3432	19 27 27.9	8.527
11	16 21 22.71	2.3489	19 35 56.3	8.419
12	16 23 43.82	2.3546	19 44 18.2	8.311
13	16 26 5.27	2.3603	19 52 33.6	8.201
14	16 28 27.06	2.3660	20 0 42.3	8.088
15	16 30 49.19	2.3717	20 8 44.2	7.975
16	16 33 11.66	2.3774	20 16 39.3	7.862
17	16 35 34.47	2.3831	20 24 27.6	7.747
18	16 37 57.63	2.3888	20 32 8.9	7.629
19	16 40 21.13	2.3944	20 39 43.1	7.511
20	16 42 44.96	2.3999	20 47 10.2	7.392
21	16 45 9.12	2.4054	20 54 30.2	7.272
22	16 47 33.61	2.4109	21 1 42.9	7.151
23	16 49 58.43	2.4164	21 8 48.3	7.028
24	16 52 23.58	2.4219	S. 21 15 46.3	6.904

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	16 52 23.58	2.4219	S.21 15 46.3	6.904
1	16 54 49.06	2.4274	21 22 36.8	6.778
2	16 57 14.87	2.4328	21 29 19.7	6.651
3	16 59 41.00	2.4382	21 35 54.9	6.522
4	17 2 7.45	2.4435	21 42 22.4	6.393
5	17 4 34.22	2.4488	21 48 42.1	6.263
6	17 7 1.31	2.4541	21 54 54.0	6.132
7	17 9 28.71	2.4592	22 0 57.9	5.999
8	17 11 56.42	2.4643	22 6 53.8	5.865
9	17 14 24.43	2.4694	22 12 41.7	5.730
10	17 16 52.75	2.4745	22 18 21.4	5.593
11	17 19 21.37	2.4795	22 23 52.9	5.456
12	17 21 50.29	2.4844	22 29 16.1	5.317
13	17 24 19.50	2.4893	22 34 30.9	5.177
14	17 26 49.00	2.4941	22 39 37.3	5.037
15	17 29 18.79	2.4988	22 44 35.3	4.896
16	17 31 48.86	2.5034	22 49 24.8	4.753
17	17 34 19.20	2.5079	22 54 5.7	4.609
18	17 36 49.81	2.5124	22 58 37.9	4.464
19	17 39 20.69	2.5169	23 3 1.4	4.318
20	17 41 51.84	2.5213	23 7 16.1	4.171
21	17 44 23.25	2.5257	23 11 21.9	4.022
22	17 46 54.92	2.5298	23 15 18.8	3.873
23	17 49 26.83	2.5338	S.23 19 6.7	3.723

FRIDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	17 51 58.98	2.5378	S.23 22 45.6	3.573
1	17 54 31.37	2.5418	23 26 15.5	3.422
2	17 57 4.00	2.5457	23 29 36.3	3.270
3	17 59 36.86	2.5495	23 32 47.9	3.116
4	18 2 9.94	2.5532	23 35 50.2	2.961
5	18 4 43.24	2.5567	23 38 43.2	2.806
6	18 7 16.75	2.5602	23 41 26.9	2.650
7	18 9 50.46	2.5635	23 44 1.2	2.493
8	18 12 24.37	2.5668	23 46 26.1	2.337
9	18 14 58.48	2.5700	23 48 41.6	2.180
10	18 17 32.77	2.5730	23 50 47.7	2.022
11	18 20 7.24	2.5760	23 52 44.2	1.862
12	18 22 41.89	2.5788	23 54 31.1	1.702
13	18 25 16.70	2.5815	23 56 8.4	1.541
14	18 27 51.67	2.5841	23 57 36.0	1.379
15	18 30 26.79	2.5866	23 58 53.9	1.218
16	18 33 2.06	2.5890	24 0 2.1	1.056
17	18 35 37.47	2.5913	24 1 0.6	0.893
18	18 38 13.02	2.5935	24 1 49.3	0.730
19	18 40 48.69	2.5955	24 2 28.2	0.566
20	18 43 24.48	2.5974	24 2 57.2	0.402
21	18 46 0.38	2.5992	24 3 16.4	0.237
22	18 48 36.39	2.6009	24 3 25.7	− 0.073
23	18 51 12.49	2.6024	24 3 25.2	+ 0.091
24	18 53 48.68	2.6038	S.24 3 14.8	0.257

SATURDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	18 53 48.68	2.6038	S.24 3 14.8	0.257
1	18 56 24.95	2.6052	24 2 54.4	0.423
2	18 59 1.30	2.6064	24 2 24.0	0.589
3	19 1 37.72	2.6075	24 1 43.7	0.755
4	19 4 14.20	2.6084	24 0 53.4	0.921
5	19 6 50.73	2.6092	23 59 53.2	1.087
6	19 9 27.30	2.6099	23 58 43.0	1.253
7	19 12 3.91	2.6105	23 57 22.8	1.420
8	19 14 40.56	2.6111	23 55 52.6	1.587
9	19 17 17.24	2.6114	23 54 12.4	1.753
10	19 19 53.93	2.6115	23 52 22.2	1.920
11	19 22 30.62	2.6115	23 50 22.0	2.086
12	19 25 7.31	2.6114	23 48 11.9	2.252
13	19 27 43.99	2.6112	23 45 51.8	2.418
14	19 30 20.66	2.6110	23 43 21.7	2.584
15	19 32 57.31	2.6106	23 40 41.7	2.750
16	19 35 33.93	2.6100	23 37 51.7	2.916
17	19 38 10.51	2.6093	23 34 51.8	3.081
18	19 40 47.05	2.6086	23 31 42.0	3.246
19	19 43 23.54	2.6077	23 28 22.3	3.410
20	19 45 59.97	2.6066	23 24 52.8	3.574
21	19 48 36.33	2.6054	23 21 13.4	3.738
22	19 51 12.62	2.6042	23 17 24.2	3.902
23	19 53 48.83	2.6028	S.23 13 25.2	4.065

SUNDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	19 56 24.96	2.6013	S.23 9 16.4	4.227
1	19 59 0.99	2.5997	23 4 57.9	4.389
2	20 1 36.92	2.5980	23 0 29.7	4.551
3	20 4 12.75	2.5962	22 55 51.8	4.712
4	20 6 48.46	2.5942	22 51 4.2	4.872
5	20 9 24.05	2.5922	22 46 7.1	5.032
6	20 11 59.52	2.5900	22 41 0.4	5.191
7	20 14 34.85	2.5877	22 35 44.2	5.349
8	20 17 10.04	2.5853	22 30 18.5	5.507
9	20 19 45.09	2.5829	22 24 43.4	5.663
10	20 22 19.99	2.5803	22 18 58.9	5.819
11	20 24 54.73	2.5776	22 13 5.1	5.974
12	20 27 29.30	2.5749	22 7 2.0	6.128
13	20 30 3.71	2.5721	22 0 49.7	6.282
14	20 32 37.95	2.5691	21 54 28.2	6.434
15	20 35 12.00	2.5659	21 47 57.6	6.586
16	20 37 45.86	2.5627	21 41 17.9	6.737
17	20 40 19.53	2.5595	21 34 29.2	6.886
18	20 42 53.00	2.5562	21 27 31.6	7.034
19	20 45 26.27	2.5528	21 20 25.1	7.182
20	20 47 59.34	2.5494	21 13 9.7	7.329
21	20 50 32.20	2.5458	21 5 45.6	7.473
22	20 53 4.84	2.5422	20 58 12.9	7.617
23	20 55 37.26	2.5385	20 50 31.6	7.760
24	20 58 9.46	2.5347	S.20 42 41.7	7.902

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 17.					WEDNESDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	20 58 9.46	2.5347	S. 20 42 41.7	7.902	0	22 54 40.05	2.3138	S. 12 6 25.5	13.011
1	21 0 41.43	2.5308	20 34 43.3	8.043	1	22 56 58.74	2.3092	11 53 22.8	13.077
2	21 3 13.16	2.5269	20 26 36.5	8.182	2	22 59 17.16	2.3046	11 40 16.2	13.142
3	21 5 44.66	2.5230	20 18 21.4	8.321	3	23 1 35.30	2.3001	11 27 5.7	13.206
4	21 8 15.92	2.5189	20 9 58.0	8.458	4	23 3 53.17	2.2957	11 13 51.5	13.267
5	21 10 46.93	2.5148	20 1 26.4	8.594	5	23 6 10.78	2.2912	11 0 33.6	13.327
6	21 13 17.70	2.5107	19 52 46.7	8.728	6	23 8 28.12	2.2867	10 47 12.2	13.386
7	21 15 48.22	2.5065	19 43 59.0	8.862	7	23 10 45.19	2.2823	10 33 47.3	13.442
8	21 18 18.48	2.5022	19 35 3.3	8.993	8	23 13 2.00	2.2780	10 20 19.1	13.497
9	21 20 48.48	2.4978	19 25 59.8	9.123	9	23 15 18.55	2.2737	10 6 47.7	13.550
10	21 23 18.22	2.4935	19 16 48.5	9.252	10	23 17 34.84	2.2694	9 53 13.1	13.602
11	21 25 47.70	2.4892	19 7 29.5	9.380	11	23 19 50.88	2.2652	9 39 35.4	13.652
12	21 28 16.92	2.4847	18 58 2.9	9.507	12	23 22 6.66	2.2609	9 25 54.8	13.700
13	21 30 45.87	2.4802	18 48 28.7	9.632	13	23 24 22.19	2.2567	9 12 11.4	13.747
14	21 33 14.55	2.4757	18 38 47.1	9.754	14	23 26 37.47	2.2526	8 58 25.2	13.792
15	21 35 42.95	2.4711	18 28 58.2	9.876	15	23 28 52.51	2.2486	8 44 36.4	13.835
16	21 38 11.08	2.4665	18 19 2.0	9.997	16	23 31 7.30	2.2445	8 30 45.0	13.877
17	21 40 38.93	2.4618	18 8 58.6	10.116	17	23 33 21.85	2.2405	8 16 51.2	13.916
18	21 43 6.50	2.4572	17 58 48.1	10.233	18	23 35 36.16	2.2366	8 2 55.1	13.954
19	21 45 33.79	2.4525	17 48 30.6	10.349	19	23 37 50.24	2.2327	7 48 56.7	13.991
20	21 48 0.80	2.4478	17 38 6.2	10.464	20	23 40 4.08	2.2288	7 34 56.2	14.026
21	21 50 27.53	2.4431	17 27 34.9	10.577	21	23 42 17.69	2.2250	7 20 53.6	14.059
22	21 52 53.97	2.4383	17 16 56.9	10.688	22	23 44 31.08	2.2212	7 6 49.1	14.091
23	21 55 20.12	2.4335	S. 17 6 12.3	10.798	23	23 46 44.24	2.2175	S. 6 52 42.7	14.121
	TUESDAY 18.					THURSDAY 20.			
0	21 57 45.99	2.4287	S. 16 55 21.2	10.906	0	23 48 57.18	2.2138	S. 6 38 34.6	14.149
1	22 0 11.57	2.4239	16 44 23.6	11.012	1	23 51 9.90	2.2102	6 24 24.8	14.177
2	22 2 36.86	2.4191	16 33 19.7	11.117	2	23 53 22.41	2.2067	6 10 13.4	14.202
3	22 5 1.86	2.4142	16 22 9.5	11.221	3	23 55 34.70	2.2032	5 56 0.6	14.225
4	22 7 26.57	2.4094	16 10 53.2	11.322	4	23 57 46.79	2.1997	5 41 46.4	14.247
5	22 9 50.99	2.4046	15 59 30.8	11.423	5	23 59 58.67	2.1963	5 27 30.9	14.268
6	22 12 15.12	2.3997	15 48 2.4	11.522	6	0 2 10.35	2.1930	5 13 14.2	14.287
7	22 14 38.96	2.3949	15 36 28.2	11.618	7	0 4 21.83	2.1897	4 58 56.5	14.304
8	22 17 2.51	2.3900	15 24 48.2	11.714	8	0 6 33.11	2.1864	4 44 37.8	14.320
9	22 19 25.76	2.3852	15 13 2.5	11.807	9	0 8 44.20	2.1832	4 30 18.1	14.336
10	22 21 48.73	2.3804	15 1 11.3	11.899	10	0 10 55.10	2.1801	4 15 57.5	14.348
11	22 24 11.41	2.3755	14 49 14.6	11.990	11	0 13 5.81	2.1770	4 1 36.3	14.358
12	22 26 33.79	2.3706	14 37 12.5	12.079	12	0 15 16.34	2.1740	3 47 14.5	14.367
13	22 28 55.88	2.3658	14 25 5.1	12.166	13	0 17 26.69	2.1710	3 32 52.2	14.376
14	22 31 17.69	2.3611	14 12 52.6	12.251	14	0 19 36.86	2.1680	3 18 29.4	14.383
15	22 33 39.21	2.3563	14 0 35.0	12.334	15	0 21 46.85	2.1651	3 4 6.2	14.389
16	22 36 0.44	2.3514	13 48 12.5	12.416	16	0 23 56.67	2.1623	2 49 42.7	14.392
17	22 38 21.38	2.3466	13 35 45.1	12.497	17	0 26 6.33	2.1596	2 35 19.1	14.394
18	22 40 42.04	2.3419	13 23 12.9	12.575	18	0 28 15.83	2.1570	2 20 55.4	14.395
19	22 43 2.41	2.3372	13 10 36.1	12.652	19	0 30 25.17	2.1543	2 6 31.7	14.394
20	22 45 22.50	2.3325	12 57 54.7	12.727	20	0 32 34.35	2.1517	1 52 8.1	14.392
21	22 47 42.31	2.3278	12 45 8.8	12.801	21	0 34 43.37	2.1491	1 37 44.6	14.390
22	22 50 1.83	2.3231	12 32 18.6	12.873	22	0 36 52.24	2.1467	1 23 21.3	14.385
23	22 52 21.08	2.3185	12 19 24.1	12.943	23	0 39 0.97	2.1443	1 8 58.4	14.377
24	22 54 40.05	2.3138	S. 12 6 25.5	13.011	24	0 41 9.55	2.1419	S. 0 54 36.0	14.369

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	0 41 9.55	2.1419	S. 0 54 36.0	14.369
1	0 43 18.00	2.1396	0 40 14.1	14.361
2	0 45 26.31	2.1373	0 25 52.7	14.351
3	0 47 34.48	2.1351	S. 0 11 32.0	14.338
4	0 49 42.52	2.1330	N. 0 2 47.9	14.325
5	0 51 50.44	2.1309	0 17 7.0	14.311
6	0 53 58.23	2.1288	0 31 25.2	14.295
7	0 56 5.90	2.1269	0 45 42.4	14.277
8	0 58 13.46	2.1250	0 59 58.5	14.258
9	1 0 20.90	2.1231	1 14 13.4	14.238
10	1 2 28.23	2.1213	1 28 27.1	14.217
11	1 4 35.46	2.1196	1 42 39.4	14.194
12	1 6 42.59	2.1179	1 56 50.3	14.170
13	1 8 49.61	2.1162	2 10 59.8	14.145
14	1 10 56.54	2.1147	2 25 7.7	14.118
15	1 13 3.38	2.1132	2 39 14.0	14.091
16	1 15 10.13	2.1117	2 53 18.6	14.062
17	1 17 16.79	2.1103	3 7 21.4	14.032
18	1 19 23.36	2.1089	3 21 22.4	14.000
19	1 21 29.85	2.1076	3 35 21.4	13.967
20	1 23 36.27	2.1063	3 49 18.4	13.933
21	1 25 42.61	2.1051	4 3 13.4	13.899
22	1 27 48.88	2.1040	4 17 6.3	13.862
23	1 29 55.09	2.1029	N. 4 30 56.9	13.824

SATURDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	1 32 1.23	2.1018	N. 4 44 45.2	13.785
1	1 34 7.31	2.1008	4 58 31.1	13.745
2	1 36 13.33	2.0999	5 12 14.6	13.704
3	1 38 19.30	2.0990	5 25 55.6	13.662
4	1 40 25.21	2.0981	5 39 34.1	13.620
5	1 42 31.07	2.0973	5 53 10.0	13.576
6	1 44 36.89	2.0966	6 6 43.2	13.530
7	1 46 42.66	2.0959	6 20 13.6	13.483
8	1 48 48.39	2.0953	6 33 41.2	13.436
9	1 50 54.09	2.0947	6 47 5.9	13.387
10	1 52 59.75	2.0941	7 0 27.6	13.337
11	1 55 5.38	2.0936	7 13 46.3	13.286
12	1 57 10.99	2.0932	7 27 1.9	13.233
13	1 59 16.57	2.0928	7 40 14.3	13.180
14	2 1 22.13	2.0924	7 53 23.5	13.127
15	2 3 27.66	2.0920	8 6 29.5	13.073
16	2 5 33.17	2.0918	8 19 32.2	13.017
17	2 7 38.67	2.0916	8 32 31.5	12.959
18	2 9 44.16	2.0914	8 45 27.3	12.901
19	2 11 49.64	2.0913	8 58 19.6	12.842
20	2 13 55.11	2.0912	9 11 8.3	12.782
21	2 16 0.58	2.0912	9 23 53.4	12.721
22	2 18 6.05	2.0912	9 36 34.8	12.659
23	2 20 11.52	2.0912	9 49 12.5	12.596
24	2 22 16.99	2.0913	N.10 1 46.3	12.532

SUNDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	2 22 16.99	2.0913	N.10 1 46.3	12.532
1	2 24 22.47	2.0914	10 14 16.3	12.467
2	2 26 27.96	2.0915	10 26 42.4	12.402
3	2 28 33.45	2.0917	10 39 4.5	12.335
4	2 30 38.96	2.0919	10 51 22.6	12.268
5	2 32 44.48	2.0922	11 3 36.7	12.200
6	2 34 50.02	2.0925	11 15 46.6	12.130
7	2 36 55.58	2.0928	11 27 52.3	12.060
8	2 39 1.16	2.0932	11 39 53.8	11.989
9	2 41 6.76	2.0936	11 51 51.0	11.917
10	2 43 12.39	2.0941	12 3 43.9	11.845
11	2 45 18.05	2.0946	12 15 32.4	11.771
12	2 47 23.74	2.0951	12 27 16.4	11.696
13	2 49 29.46	2.0956	12 38 55.9	11.621
14	2 51 35.21	2.0962	12 50 30.9	11.545
15	2 53 41.00	2.0968	13 2 1.3	11.468
16	2 55 46.83	2.0975	13 13 27.1	11.392
17	2 57 52.70	2.0981	13 24 48.3	11.314
18	2 59 58.60	2.0987	13 36 4.8	11.235
19	3 2 4.54	2.0994	13 47 16.5	11.154
20	3 4 10.53	2.1002	13 58 23.3	11.073
21	3 6 16.57	2.1011	14 9 25.3	10.992
22	3 8 22.66	2.1019	14 20 22.4	10.910
23	3 10 28.80	2.1027	N.14 31 14.5	10.827

MONDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	3 12 34.99	2.1036	N.14 42 1.6	10.743
1	3 14 41.23	2.1044	14 52 43.7	10.659
2	3 16 47.52	2.1053	15 3 20.7	10.574
3	3 18 53.86	2.1062	15 13 52.6	10.488
4	3 21 0.26	2.1072	15 24 19.3	10.402
5	3 23 6.72	2.1081	15 34 40.8	10.315
6	3 25 13.23	2.1090	15 44 57.1	10.227
7	3 27 19.80	2.1101	15 55 8.1	10.138
8	3 29 26.44	2.1112	16 5 13.7	10.049
9	3 31 33.14	2.1122	16 15 14.0	9.960
10	3 33 39.90	2.1132	16 25 8.9	9.870
11	3 35 46.72	2.1142	16 34 58.4	9.779
12	3 37 53.60	2.1152	16 44 42.4	9.687
13	3 40 0.55	2.1163	16 54 20.9	9.595
14	3 42 7.56	2.1174	17 3 53.8	9.502
15	3 44 14.64	2.1186	17 13 21.1	9.408
16	3 46 21.79	2.1197	17 22 42.8	9.314
17	3 48 29.01	2.1209	17 31 58.8	9.219
18	3 50 36.30	2.1221	17 41 9.1	9.124
19	3 52 43.66	2.1232	17 50 13.7	9.028
20	3 54 51.08	2.1243	17 59 12.5	8.932
21	3 56 58.57	2.1254	18 8 5.5	8.835
22	3 59 6.13	2.1266	18 16 52.7	8.737
23	4 1 13.76	2.1277	18 25 34.0	8.639
24	4 3 21.46	2.1289	N.18 34 9.4	8.541

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 25.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	4 3 21.46	2.1289	N.18 34 9.4	8.541
1	4 5 29.23	2.1301	18 42 38.9	8.442
2	4 7 37.07	2.1313	18 51 2.4	8.342
3	4 9 44.99	2.1326	18 59 19.9	8.242
4	4 11 52.98	2.1338	19 7 31.4	8.142
5	4 14 1.04	2.1349	19 15 36.9	8.041
6	4 16 9.17	2.1361	19 23 36.3	7.939
7	4 18 17.37	2.1372	19 31 29.6	7.837
8	4 20 25.64	2.1384	19 39 16.7	7.734
9	4 22 33.98	2.1396	19 46 57.7	7.631
10	4 24 42.39	2.1407	19 54 32.5	7.527
11	4 26 50.87	2.1419	20 2 1.0	7.423
12	4 28 59.42	2.1431	20 9 23.3	7.319
13	4 31 8.04	2.1442	20 16 39.3	7.214
14	4 33 16.73	2.1454	20 23 49.0	7.109
15	4 35 25.49	2.1465	20 30 52.4	7.004
16	4 37 34.31	2.1476	20 37 49.5	6.898
17	4 39 43.20	2.1487	20 44 40.2	6.792
18	4 41 52.16	2.1498	20 51 24.5	6.685
19	4 44 1.18	2.1509	20 58 2.4	6.577
20	4 46 10.27	2.1520	21 4 33.8	6.470
21	4 48 19.42	2.1530	21 10 58.8	6.362
22	4 50 28.63	2.1541	21 17 17.3	6.254
23	4 52 37.91	2.1552	N.21 23 29.3	6.146

WEDNESDAY 26.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	4 54 47.25	2.1562	N.21 29 34.8	6.037
1	4 56 56.65	2.1572	21 35 33.7	5.927
2	4 59 6.11	2.1581	21 41 26.1	5.818
3	5 1 15.62	2.1590	21 47 11.9	5.708
4	5 3 25.19	2.1600	21 52 51.1	5.597
5	5 5 34.82	2.1609	21 58 23.6	5.487
6	5 7 44.50	2.1618	22 3 49.5	5.376
7	5 9 54.23	2.1627	22 9 8.7	5.265
8	5 12 4.02	2.1636	22 14 21.3	5.154
9	5 14 13.86	2.1644	22 19 27.2	5.043
10	5 16 23.75	2.1652	22 24 26.4	4.931
11	5 18 33.68	2.1659	22 29 18.9	4.818
12	5 20 43.66	2.1667	22 34 4.6	4.706
13	5 22 53.68	2.1674	22 38 43.6	4.593
14	5 25 3.75	2.1682	22 43 15.8	4.480
15	5 27 13.86	2.1688	22 47 41.2	4.368
16	5 29 24.01	2.1695	22 51 59.9	4.255
17	5 31 34.20	2.1701	22 56 11.8	4.141
18	5 33 44.42	2.1707	23 0 16.8	4.027
19	5 35 54.68	2.1712	23 4 15.0	3.913
20	5 38 4.97	2.1717	23 8 6.4	3.799
21	5 40 15.29	2.1722	23 11 50.9	3.684
22	5 42 25.64	2.1727	23 15 28.5	3.570
23	5 44 36.01	2.1731	23 18 59.3	3.456
24	5 46 46.41	2.1735	N.23 22 23.2	3.341

THURSDAY 27.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	5 46 46.41	2.1735	N.23 22 23.2	3.341
1	5 48 56.83	2.1738	23 25 40.2	3.226
2	5 51 7.27	2.1742	23 28 50.3	3.112
3	5 53 17.74	2.1746	23 31 53.6	2.997
4	5 55 28.22	2.1749	23 34 49.9	2.881
5	5 57 38.72	2.1751	23 37 39.3	2.766
6	5 59 49.23	2.1753	23 40 21.8	2.651
7	6 1 59.75	2.1754	23 42 57.4	2.535
8	6 4 10.28	2.1756	23 45 26.0	2.419
9	6 6 20.82	2.1757	23 47 47.7	2.304
10	6 8 31.36	2.1757	23 50 2.5	2.188
11	6 10 41.90	2.1758	23 52 10.3	2.072
12	6 12 52.45	2.1758	23 54 11.2	1.957
13	6 15 2.99	2.1757	23 56 5.1	1.841
14	6 17 13.53	2.1756	23 57 52.1	1.726
15	6 19 24.06	2.1754	23 59 32.2	1.610
16	6 21 34.58	2.1753	24 1 5.3	1.493
17	6 23 45.09	2.1751	24 2 31.4	1.377
18	6 25 55.59	2.1748	24 3 50.6	1.262
19	6 28 6.07	2.1745	24 5 2.8	1.146
20	6 30 16.53	2.1742	24 6 8.1	1.031
21	6 32 26.98	2.1739	24 7 6.5	0.915
22	6 34 37.40	2.1735	24 7 57.9	0.799
23	6 36 47.80	2.1731	N.24 8 42.4	0.684

FRIDAY 28.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	6 38 58.17	2.1726	N.24 9 20.0	0.568
1	6 41 8.51	2.1721	24 9 50.6	0.452
2	6 43 18.82	2.1716	24 10 14.3	0.337
3	6 45 29.10	2.1710	24 10 31.1	0.222
4	6 47 39.34	2.1703	24 10 40.9	+ 0.106
5	6 49 49.54	2.1697	24 10 43.8	− 0.009
6	6 51 59.70	2.1690	24 10 39.8	0.124
7	6 54 9.82	2.1682	24 10 28.9	0.239
8	6 56 19.89	2.1675	24 10 11.1	0.354
9	6 58 29.92	2.1667	24 9 46.4	0.468
10	7 0 39.90	2.1658	24 9 14.9	0.582
11	7 2 49.82	2.1649	24 8 36.5	0.697
12	7 4 59.69	2.1640	24 7 51.2	0.812
13	7 7 9.50	2.1630	24 6 59.1	0.926
14	7 9 19.25	2.1621	24 6 0.1	1.040
15	7 11 28.95	2.1611	24 4 54.3	1.153
16	7 13 38.58	2.1600	24 3 41.7	1.267
17	7 15 48.15	2.1589	24 2 22.2	1.381
18	7 17 57.65	2.1578	24 0 55.9	1.494
19	7 20 7.08	2.1566	23 59 22.9	1.607
20	7 22 16.44	2.1553	23 57 43.1	1.720
21	7 24 25.72	2.1541	23 55 56.5	1.832
22	7 26 34.93	2.1528	33 54 3.2	1.945
23	7 28 44.06	2.1515	23 52 3.1	2.057
21	7 30 53.11	2.1502	N.23 49 56.3	2.169

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	7 30 53.11	2.1502	N.23 49 56.3	2.169
1	7 33 2.08	2.1488	23 47 42.8	2.281
2	7 35 10.97	2.1474	23 45 22.6	2.392
3	7 37 19.77	2.1460	23 42 55.8	2.503
4	7 39 28.49	2.1445	23 40 22.3	2.614
5	7 41 37.11	2.1429	23 37 42.1	2.725
6	7 43 45.64	2.1414	23 34 55.3	2.835
7	7 45 54.08	2.1399	23 32 1.9	2.945
8	7 48 2.43	2.1383	23 29 1.9	3.055
9	7 50 10.68	2.1367	23 25 55.3	3.164
10	7 52 18.83	2.1350	23 22 42.2	3.273
11	7 54 26.88	2.1334	23 19 22.6	3.382
12	7 56 34.84	2.1317	23 15 56.4	3.491
13	7 58 42.69	2.1300	23 12 23.7	3.599
14	8 0 50.44	2.1282	23 8 44.5	3.707
15	8 2 58.08	2.1264	23 4 58.9	3.814
16	8 5 5.61	2.1246	23 1 6.9	3.921
17	8 7 13.03	2.1228	22 57 8.4	4.028
18	8 9 20.35	2.1211	22 53 3.5	4.134
19	8 11 27.56	2.1192	22 48 52.3	4.240
20	8 13 34.65	2.1172	22 44 34.7	4.346
21	8 15 41.63	2.1153	22 40 10.7	4.452
22	8 17 48.49	2.1134	22 35 40.4	4.557
23	8 19 55.24	2.1115	N.22 31 3.9	4.661

SUNDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	8 22 1.87	2.1095	N.22 26 21.1	4.765
1	8 24 8.38	2.1075	22 21 32.1	4.868
2	8 26 14.77	2.1055	22 16 36.9	4.972
3	8 28 21.04	2.1035	22 11 35.4	5.076
4	8 30 27.19	2.1015	22 6 27.8	5.178
5	8 32 33.22	2.0994	22 1 14.1	5.279
6	8 34 39.12	2.0973	21 55 54.3	5.381
7	8 36 44.90	2.0953	21 50 28.4	5.482
8	8 38 50.56	2.0932	21 44 56.4	5.583
9	8 40 56.09	2.0911	21 39 18.4	5.683
10	8 43 1.49	2.0890	21 33 34.4	5.783
11	8 45 6.77	2.0869	21 27 44.4	5.883
12	8 47 11.92	2.0847	21 21 48.4	5.983
13	8 49 16.94	2.0826	21 15 46.5	6.081
14	8 51 21.83	2.0805	21 9 38.7	6.178
15	8 53 26.60	2.0784	21 3 25.1	6.276
16	8 55 31.24	2.0762	20 57 5.6	6.373
17	8 57 35.75	2.0740	20 50 40.3	6.469
18	8 59 40.12	2.0718	20 44 9.3	6.565
19	9 1 44.36	2.0697	20 37 32.5	6.661
20	9 3 48.48	2.0676	20 30 50.0	6.756
21	9 5 52.47	2.0654	20 24 1.8	6.851
22	9 7 56.33	2.0632	20 17 7.9	6.946
23	9 10 0.05	2.0609	20 10 8.3	7.040
24	9 12 3.64	2.0588	N.20 3 3.1	7.133

MONDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	9 12 3.64	2.0588	N.20 3 3.1	7.133
1	9 14 7.11	2.0566	19 55 52.4	7.225
2	9 16 10.44	2.0544	19 48 36.1	7.317
3	9 18 13.64	2.0523	19 41 14.3	7.408
4	9 20 16.71	2.0502	19 33 47.1	7.499
5	9 22 19.66	2.0480	19 26 14.4	7.590
6	9 24 22.47	2.0458	19 18 36.3	7.680
7	9 26 25.15	2.0437	19 10 52.8	7.769
8	9 28 27.71	2.0416	19 3 4.0	7.858
9	9 30 30.14	2.0394	18 55 9.8	7.947
10	9 32 32.44	2.0373	18 47 10.4	8.034
11	9 34 34.61	2.0352	18 39 5.7	8.121
12	9 36 36.66	2.0331	18 30 55.8	8.208
13	9 38 38.58	2.0309	18 22 40.7	8.294
14	9 40 40.37	2.0288	18 14 20.5	8.379
15	9 42 42.04	2.0267	18 5 55.2	8.464
16	9 44 43.58	2.0247	17 57 24.8	8.549
17	9 46 45.00	2.0227	17 48 49.3	8.633
18	9 48 46.30	2.0206	17 40 8.8	8.717
19	9 50 47.47	2.0186	17 31 23.3	8.799
20	9 52 48.53	2.0167	17 22 32.9	8.881
21	9 54 49.47	2.0147	17 13 37.6	8.962
22	9 56 50.29	2.0127	17 4 37.4	9.043
23	9 58 50.99	2.0107	N.16 55 32.4	9.123

TUESDAY, APRIL 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	10 0 51.57	2.0087	N.16 46 22.6	9.203

PHASES OF THE MOON.

		d	h	m
○ Full Moon . .	March	6	6	47.4
☾ Last Quarter		13	16	4.7
● New Moon		20	9	1.4
☽ First Quarter		27	21	32.6

		d	h
☾ Apogee . . .	March	1	15.7
☾ Perigee		17	14.9
☾ Apogee		29	9.7

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Sun	W.	121° 44′ 51″	3486	123° 5′ 31″	3487	124° 26′ 9″	3487	125° 46′ 47″	3488
	α Arietis	W.	66 42 23	3234	68 7 52	3230	69 33 25	3228	70 59 1	3225
	Aldebaran	W.	34 58 16	3102	36 26 23	3101	37 54 31	3100	39 22 41	3098
	Regulus	E.	45 39 20	3098	44 11 7	3099	42 42 56	3100	41 14 46	3101
	Saturn	E.	47 1 1	3058	45 32 0	3059	44 3 0	3059	42 34 0	3060
	Spica	E.	99 41 31	3108	98 13 32	3108	96 45 34	3108	95 17 35	3108
2	α Arietis	W.	78 7 58	3208	79 33 58	3204	81 0 3	3200	82 26 12	3195
	Aldebaran	W.	46 44 9	3086	48 12 36	3082	49 41 7	3078	51 9 43	3075
	Regulus	E.	33 54 10	3102	32 26 3	3102	30 57 56	3103	29 29 51	3103
	Saturn	E.	35 8 59	3056	33 39 55	3055	32 10 50	3053	30 41 43	3051
	Spica	E.	87 57 22	3099	86 29 12	3097	85 1 0	3095	83 32 45	3092
3	α Arietis	W.	89 38 18	3173	91 4 59	3168	92 31 46	3163	93 58 39	3158
	Aldebaran	W.	58 33 55	3053	60 3 3	3047	61 32 17	3042	63 1 37	3036
	Spica	E.	76 10 27	3072	74 41 44	3068	73 12 57	3064	71 44 3	3059
4	Aldebaran	W.	70 30 11	3005	72 0 17	2998	73 30 32	2992	75 0 55	2985
	Pollux	W.	26 34 55	3069	28 3 42	3056	29 32 45	3043	31 2 4	3031
	Spica	E.	64 18 4	3033	62 48 32	3028	61 18 53	3022	59 49 7	3016
	Mars	E.	103 0 43	3146	101 33 29	3139	100 6 7	3132	98 38 36	3125
	Antares	E.	110 11 52	3026	108 42 12	3019	107 12 24	3012	105 42 26	3005
5	Aldebaran	W.	82 35 7	2947	84 6 26	2940	85 37 54	2932	87 9 32	2923
	Pollux	W.	38 32 13	2977	40 2 54	2967	41 33 48	2957	43 4 55	2947
	Spica	E.	52 18 32	2987	50 48 3	2981	49 17 28	2975	47 46 45	2969
	Mars	E.	91 18 45	3086	89 50 18	3077	88 21 40	3069	86 52 53	3060
	Antares	E.	98 10 17	2966	96 39 22	2958	95 8 18	2950	93 37 3	2942
6	Pollux	W.	50 43 30	2900	52 15 49	2891	53 48 20	2881	55 21 3	2872
	Spica	E.	40 11 41	2949	38 40 25	2946	37 9 4	2943	35 37 40	2941
	Mars	E.	79 26 20	3018	77 56 29	3009	76 26 28	3000	74 56 15	2992
	Antares	E.	85 58 18	2902	84 26 2	2894	82 53 35	2886	81 20 58	2878
7	Pollux	W.	63 7 33	2828	64 41 25	2818	66 15 30	2809	67 49 46	2800
	Regulus	W.	27 12 37	2852	28 45 57	2840	30 19 33	2828	31 53 25	2815
	Mars	E.	67 22 27	2947	65 51 8	2938	64 19 37	2929	62 47 55	2920
	Antares	E.	73 35 18	2837	72 1 39	2829	70 27 50	2821	68 53 50	2813
	α Aquilæ	E.	117 8 41	3730	115 52 26	3697	114 35 36	3667	113 18 14	3636
8	Pollux	W.	75 44 4	2755	77 19 30	2747	78 55 7	2739	80 30 55	2730
	Regulus	W.	39 46 23	2763	41 21 39	2753	42 57 8	2744	44 32 50	2734
	Saturn	W.	38 47 58	2726	40 24 3	2717	42 0 20	2708	43 36 49	2699
	Mars	E.	55 6 35	2875	53 33 44	2866	52 0 42	2858	50 27 29	2849
	Antares	E.	61 1 19	2775	59 26 19	2767	57 51 10	2760	56 15 51	2753
	α Aquilæ	E.	106 44 4	3515	105 23 57	3495	104 3 27	3476	102 42 36	3459
9	Pollux	W.	88 32 50	2687	90 9 47	2678	91 46 56	2670	93 24 16	2661
	Regulus	W.	52 34 30	2687	54 11 27	2678	55 48 36	2669	57 25 57	2660
	Saturn	W.	51 42 15	2655	53 19 55	2646	54 57 47	2637	56 35 51	2629
	Mars	E.	42 38 30	2804	41 4 8	2795	39 29 34	2786	37 54 48	2778
	Antares	E.	48 17 1	2721	46 40 50	2715	45 4 31	2709	43 28 4	2704

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	SUN	W.	127° 7′ 24″	3488	128° 28′ 1″	3487	129° 48′ 39″	3487	131° 9′ 17″	3486
	α Arietis	W.	72 24 40	3221	73 50 23	3218	75 16 11	3215	76 42 2	3211
	Aldebaran	W.	40 50 53	3096	42 19 8	3094	43 47 25	3091	45 15 45	3088
	Regulus	E.	39 46 38	3101	38 18 30	3102	36 50 23	3102	35 22 16	3103
	SATURN	E.	41 5 1	3060	39 36 2	3059	38 7 2	3058	36 38 1	3057
	Spica	E.	93 49 35	3107	92 21 34	3106	90 53 32	3104	89 25 28	3102
2	α Arietis	W.	83 52 27	3191	85 18 47	3187	86 45 12	3182	88 11 42	3177
	Aldebaran	W.	52 38 23	3071	54 7 8	3067	55 35 58	3063	57 4 53	3057
	Regulus	E.	28 1 46	3105	26 33 42	3106	25 5 39	3108	23 37 39	3110
	SATURN	E.	29 12 34	3049	27 43 22	3047	26 14 8	3047	24 44 53	3046
	Spica	E.	82 4 26	3089	80 36 3	3085	79 7 36	3081	77 39 4	3077
3	α Arietis	W.	95 25 38	3153	96 52 43	3148	98 19 54	3143	99 47 11	3138
	Aldebaran	W.	64 31 5	3030	66 0 40	3024	67 30 23	3018	69 0 13	3012
	Spica	E.	70 15 4	3054	68 45 58	3049	67 16 46	3044	65 47 28	3039
4	Aldebaran	W.	76 31 27	2977	78 2 8	2970	79 32 58	2962	81 3 58	2955
	Pollux	W.	32 31 38	3020	34 1 26	3009	35 31 28	2998	37 1 44	2987
	Spica	E.	58 19 15	3010	56 49 15	3005	55 19 7	2999	53 48 53	2993
	MARS	E.	97 10 57	3117	95 43 8	3109	94 15 10	3101	92 47 2	3094
	Antares	E.	104 12 19	2997	102 42 3	2990	101 11 37	2982	99 41 2	2974
5	Aldebaran	W.	88 41 21	2916	90 13 19	2908	91 45 28	2900	93 17 47	2892
	Pollux	W.	44 36 14	2938	46 7 45	2928	47 39 28	2919	49 11 23	2909
	Spica	E.	46 15 57	2965	44 45 1	2960	43 14 0	2957	41 42 53	2953
	MARS	E.	85 23 55	3052	83 54 47	3043	82 25 28	3035	80 55 59	3027
	Antares	E.	92 5 39	2934	90 34 4	2926	89 2 19	2918	87 30 23	2910
6	Pollux	W.	56 53 57	2863	58 27 4	2854	60 0 22	2845	61 33 52	2836
	Spica	E.	34 6 14	2941	32 34 48	2941	31 3 21	2943	29 31 57	2946
	MARS	E.	73 25 52	2983	71 55 18	2974	70 24 32	2965	68 53 35	2956
	Antares	E.	79 48 11	2870	78 15 14	2862	76 42 6	2854	75 8 47	2846
7	Pollux	W.	69 24 14	2791	70 58 54	2782	72 33 46	2773	74 8 49	2764
	Regulus	W.	33 27 33	2805	35 1 54	2794	36 36 30	2783	38 11 20	2773
	MARS	E.	61 16 2	2911	59 43 57	2902	58 11 41	2893	56 39 14	2884
	Antares	E.	67 19 39	2806	65 45 19	2798	64 10 49	2790	62 36 9	2782
	α Aquilæ	E.	112 0 19	3610	110 41 56	3584	109 23 5	3559	108 3 46	3538
8	Pollux	W.	82 6 55	2722	83 43 6	2713	85 19 29	2704	86 56 4	2695
	Regulus	W.	46 8 45	2724	47 44 53	2715	49 21 13	2706	50 57 45	2696
	SATURN	W.	45 13 30	2690	46 50 23	2681	48 27 29	2672	50 4 46	2663
	MARS	E.	48 54 4	2840	47 20 28	2831	45 46 40	2822	44 12 41	2813
	Antares	E.	54 40 23	2746	53 4 45	2739	51 28 59	2733	49 53 4	2727
	α Aquilæ	E.	101 21 26	3441	99 59 56	3426	98 38 9	3412	97 16 6	3398
9	Pollux	W.	95 1 48	2653	96 39 31	2645	98 17 25	2637	99 55 30	2628
	Regulus	W.	59 3 30	2651	60 41 15	2643	62 19 12	2634	63 57 21	2624
	SATURN	W.	58 14 6	2620	59 52 33	2612	61 31 12	2603	63 10 3	2594
	MARS	E.	36 19 51	2769	34 44 42	2760	33 9 22	2751	31 33 50	2742
	Antares	E.	41 51 31	2700	40 14 51	2696	38 38 6	2692	37 1 16	2690

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
9	α Aquilæ	E.	95° 53′ 48″	3385	94° 31′ 15″	3373	93° 8′ 28″	3363	91° 45′ 29″	3354
	Jupiter	E.	102 7 48	2743	100 32 5	2734	98 56 10	2725	97 20 4	2716
10	Regulus	W.	65 35 43	2616	67 14 16	2607	68 53 2	2598	70 32 0	2590
	Saturn	W.	64 49 6	2585	66 28 21	2577	68 7 47	2569	69 47 25	2560
	Antares	E.	35 24 22	2688	33 47 26	2686	32 10 28	2686	30 33 30	2688
	α Aquilæ	E.	84 48 12	3320	83 24 24	3316	82 0 31	3313	80 36 35	3311
	Jupiter	E.	89 16 39	2673	87 39 23	2664	86 1 55	2655	84 24 15	2647
11	Regulus	W.	78 49 49	2546	80 29 59	2537	82 10 21	2527	83 50 56	2519
	Saturn	W.	78 8 35	2517	79 49 25	2508	81 30 27	2499	83 11 41	2490
	Spica	W.	25 24 8	2689	27 1 2	2664	28 38 30	2642	30 16 28	2621
	α Aquilæ	E.	73 36 58	3324	72 13 13	3330	70 49 36	3336	69 26 7	3347
	Jupiter	E.	76 13 0	2603	74 34 9	2594	72 55 6	2585	71 15 51	2576
	Sun	E.	123 41 5	2896	122 8 41	2885	120 36 3	2875	119 3 12	2865
12	Regulus	W.	92 16 56	2474	93 58 46	2465	95 40 48	2456	97 23 3	2448
	Saturn	W.	91 40 59	2446	93 23 28	2438	95 6 9	2429	96 49 3	2419
	Spica	W.	38 32 39	2538	40 12 59	2524	41 53 38	2511	43 34 36	2498
	α Aquilæ	E.	62 32 15	3426	61 10 28	3449	59 49 7	3475	58 28 15	3505
	Jupiter	E.	62 56 30	2532	61 16 1	2522	59 35 19	2514	57 54 25	2505
	Sun	E.	111 15 43	2814	109 41 34	2804	108 7 12	2794	106 32 36	2785
13	Regulus	W.	105 57 26	2403	107 40 56	2394	109 24 39	2385	111 8 35	2377
	Spica	W.	52 3 48	2438	53 46 28	2427	55 29 23	2416	57 12 34	2405
	Jupiter	E.	49 26 47	2460	47 44 38	2451	46 2 16	2443	44 19 43	2434
	α Aquilæ	E.	51 53 39	3720	50 37 13	3778	49 21 48	3846	48 7 34	3921
	Sun	E.	98 36 26	2735	97 0 33	2725	95 24 26	2715	93 48 6	2706
14	Spica	W.	65 52 10	2356	67 36 48	2346	69 21 40	2336	71 6 46	2327
	Mars	W.	22 59 27	2436	24 42 10	2427	26 25 6	2418	28 8 16	2409
	Antares	W.	20 26 29	2525	22 7 7	2492	23 48 31	2462	25 30 37	2435
	Jupiter	E.	35 43 55	2393	34 0 10	2386	32 16 15	2378	30 32 10	2372
	Sun	E.	85 43 15	2658	84 5 39	2649	82 27 50	2640	80 49 49	2631
15	Spica	W.	79 55 28	2285	81 41 49	2277	83 28 22	2269	85 15 6	2262
	Mars	W.	36 47 17	2365	38 31 43	2357	40 16 20	2349	42 1 8	2341
	Antares	W.	34 9 39	2336	35 54 46	2322	37 40 13	2308	39 25 59	2297
	Sun	E.	72 36 45	2588	70 57 34	2581	69 18 13	2573	67 38 41	2566
16	Spica	W.	94 11 21	2230	95 59 3	2225	97 46 54	2220	99 34 52	2215
	Mars	W.	50 47 51	2306	52 33 41	2300	54 19 40	2295	56 5 47	2289
	Antares	W.	48 19 0	2246	50 6 19	2239	51 53 48	2232	53 41 29	2225
	Sun	E.	59 18 41	2535	57 38 16	2529	55 57 43	2525	54 17 4	2520
17	Mars	W.	64 58 11	2268	66 44 57	2265	68 31 48	2263	70 18 42	2261
	Antares	W.	62 42 11	2198	64 30 41	2194	66 19 17	2191	68 7 58	2188
	Sun	E.	45 52 34	2507	44 11 31	2506	42 30 26	2506	40 49 21	2506
18	Mars	W.	79 13 46	2257	81 0 48	2257	82 47 50	2259	84 34 49	2262
	Antares	W.	77 12 3	2184	79 0 55	2184	80 49 46	2186	82 38 34	2188
	Sun	E.	32 24 38	2525	30 44 0	2533	29 3 32	2542	27 23 17	2553

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
9	α Aquilæ	E.	90° 22′ 20″	3344	88° 59′ 0″	3337	87° 35′ 32″	3330	86° 11′ 55″	3324
	Jupiter	E.	95 43 46	2708	94 7 17	2699	92 30 36	2690	90 53 43	2682
10	Regulus	W.	72 11 9	2580	73 50 31	2571	75 30 5	2563	77 9 51	2554
	Saturn	W.	71 27 15	2551	73 7 17	2543	74 47 31	2534	76 27 57	2525
	Antares	E.	28 56 34	2693	27 19 45	2699	25 43 3	2705	24 6 30	2716
	α Aquilæ	E.	79 12 37	3311	77 48 39	3313	76 24 43	3315	75 0 48	3318
	Jupiter	E.	82 46 24	2638	81 8 21	2629	79 30 6	2620	77 51 39	2612
11	Regulus	W.	85 31 43	2510	87 12 42	2501	88 53 54	2492	90 35 19	2483
	Saturn	W.	84 53 8	2482	86 34 47	2473	88 16 39	2464	89 58 43	2455
	Spica	W.	31 54 54	2601	33 33 45	2584	35 13 1	2568	36 52 39	2652
	α Aquilæ	E.	68 2 50	3358	66 39 46	3371	65 16 57	3387	63 54 26	3405
	Jupiter	E.	69 36 23	2567	67 56 43	2558	66 16 51	2550	64 36 47	2540
	Sun	E.	117 30 8	2855	115 56 51	2845	114 23 21	2835	112 49 38	2825
12	Regulus	W.	99 5 30	2438	100 48 10	2429	102 31 3	2421	104 14 8	2412
	Saturn	W.	98 32 10	2410	100 15 30	2402	101 59 2	2393	103 42 47	2384
	Spica	W.	45 15 53	2486	46 57 26	2473	48 39 17	2461	50 21 25	2450
	α Aquilæ	E.	57 7 57	3541	55 48 18	3578	54 29 18	3619	53 11 4	3664
	Jupiter	E.	56 13 18	2496	54 31 59	2487	52 50 27	2478	51 8 43	2469
	Sun	E.	104 57 48	2775	103 22 47	2765	101 47 33	2755	100 12 6	2745
13	Regulus	W.	112 52 43	2368	114 37 4	2359	116 21 37	2351	118 6 22	2343
	Spica	W.	58 56 0	2395	60 39 41	2385	62 23 36	2375	64 7 46	2365
	Jupiter	E.	42 36 57	2426	40 53 59	2418	39 10 49	2410	37 27 28	2401
	α Aquilæ	E.	46 54 36	4005	45 43 2	4100	44 33 1	4206	43 24 41	4329
	Sun	E.	92 11 34	2695	90 34 48	2686	88 57 50	2677	87 20 39	2667
14	Spica	W.	72 52 5	2319	74 37 37	2310	76 23 22	2301	78 9 19	2293
	Mars	W.	29 51 38	2399	31 35 14	2391	33 19 2	2382	35 3 3	2373
	Antares	W.	27 13 21	2409	28 56 42	2387	30 40 37	2369	32 24 56	2352
	Jupiter	E.	28 47 55	2366	27 3 31	2360	25 18 58	2355	23 34 18	2350
	Sun	E.	79 11 35	2622	77 33 10	2613	75 54 33	2605	74 15 45	2506
15	Spica	W.	87 2 1	2255	88 49 6	2248	90 36 22	2242	92 23 46	2236
	Mars	W.	43 46 8	2334	45 31 18	2326	47 16 39	2319	49 2 10	2313
	Antares	W.	41 12 4	2284	42 58 26	2274	44 45 3	2264	46 31 55	2255
	Sun	E.	65 59 0	2559	64 19 9	2552	62 39 8	2546	60 58 59	2540
16	Spica	W.	101 22 57	2210	103 11 9	2207	104 59 26	2204	106 47 48	2200
	Mars	W.	57 52 2	2284	59 38 25	2280	61 24 54	2276	63 11 30	2272
	Antares	W.	55 29 20	2218	57 17 21	2212	59 5 30	2207	60 53 47	2202
	Sun	E.	52 36 19	2517	50 55 29	2513	49 14 34	2510	47 33 35	2509
17	Mars	W.	72 5 39	2259	73 52 39	2257	75 39 41	2257	77 26 43	2257
	Antares	W.	69 56 42	2186	71 45 30	2185	73 34 20	2184	75 23 11	2184
	Sun	E.	39 8 16	2509	37 27 15	2511	35 46 17	2515	34 5 24	2520
18	Mars	W.	86 21 45	2264	88 8 38	2267	89 55 26	2270	91 42 9	2274
	Antares	W.	84 27 20	2190	86 16 3	2194	88 4 40	2196	89 53 13	2201
	Sun	E.	25 43 18	2566	24 3 37	2584	22 24 20	2605	20 45 32	2632

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
22	Sun	W.	21° 40′ 15″	2879	23° 13′ 1″	2882	24° 45′ 43″	2887	26° 18′ 19″	2893
	Pollux	E.	89 11 37	2449	87 29 12	2464	85 47 8	2479	84 5 26	2495
23	Sun	W.	33 58 25	2950	35 29 40	2964	37 0 38	2977	38 31 18	2992
	Pollux	E.	75 42 28	2576	74 3 0	2593	72 23 55	2609	70 45 12	2625
24	Sun	W.	46 0 2	3070	47 28 49	3086	48 57 16	3101	50 25 25	3116
	Pollux	E.	62 37 12	2708	61 0 43	2725	59 24 36	2741	57 48 50	2757
	Regulus	E.	98 34 54	2701	96 58 15	2716	95 21 56	2731	93 45 58	2747
25	Sun	W.	57 41 27	3193	59 7 45	3208	60 33 45	3222	61 59 28	3236
	α Arietis	W.	28 53 45	3397	30 16 5	3359	31 39 8	3329	33 2 46	3303
	Pollux	E.	49 55 18	2836	48 21 37	2852	46 48 17	2867	45 15 16	2883
	Saturn	E.	85 37 7	2798	84 2 36	2811	82 28 23	2826	80 54 29	2839
	Regulus	E.	85 51 13	2822	84 17 14	2837	82 43 34	2851	81 10 12	2864
26	Sun	W.	69 3 58	3303	70 28 6	3315	71 52 0	3326	73 15 41	3338
	α Arietis	W.	40 6 49	3231	41 32 21	3225	42 58 1	3219	44 23 47	3215
	Pollux	E.	37 34 59	2956	36 3 51	2970	34 33 1	2985	33 2 29	3000
	Saturn	E.	73 9 13	2903	71 36 58	2915	70 4 58	2926	68 33 12	2937
	Regulus	E.	73 27 37	2928	71 55 54	2940	70 24 26	2952	68 53 13	2962
27	Sun	W.	80 10 56	3388	81 33 26	3397	82 55 45	3406	84 17 55	3414
	α Arietis	W.	51 33 26	3208	52 59 25	3208	54 25 25	3208	55 51 24	3208
	Aldebaran	W.	19 27 41	3075	20 56 21	3077	22 24 59	3078	23 53 35	3079
	Pollux	E.	25 34 30	3080	24 5 56	3098	22 37 44	3116	21 9 54	3138
	Saturn	E.	60 57 38	2965	59 27 6	2993	57 56 45	3002	56 26 35	3009
	Regulus	E.	61 20 22	3012	59 50 24	3020	58 20 36	3029	56 50 59	3036
	Spica	E.	115 19 35	3033	113 50 3	3041	112 20 41	3048	110 51 28	3054
28	Sun	W.	91 6 45	3445	92 28 11	3449	93 49 32	3454	95 10 48	3458
	α Arietis	W.	63 1 10	3212	64 27 5	3213	65 52 59	3213	67 18 53	3212
	Aldebaran	W.	31 16 26	3084	32 44 55	3086	34 13 21	3087	35 41 46	3089
	Saturn	E.	48 57 50	3040	47 28 27	3044	45 59 9	3049	44 29 57	3053
	Regulus	E.	49 25 5	3069	47 56 17	3074	46 27 35	3079	44 59 0	3083
	Spica	E.	103 27 11	3081	101 58 38	3085	100 30 10	3089	99 1 47	3092
29	Sun	W.	101 56 15	3469	103 17 14	3469	104 38 13	3469	105 59 12	3469
	α Arietis	W.	74 28 29	3209	75 54 27	3208	77 20 26	3207	78 46 27	3205
	Aldebaran	W.	43 3 31	3091	44 31 51	3091	46 0 11	3090	47 28 33	3089
	Saturn	E.	37 5 0	3066	35 36 9	3068	34 7 20	3069	32 38 33	3070
	Regulus	E.	37 37 16	3100	36 9 6	3103	34 41 0	3105	33 12 57	3108
	Spica	E.	91 40 36	3100	90 12 27	3101	88 44 19	3101	87 16 11	3100
30	Sun	W.	112 44 21	3460	114 5 30	3457	115 26 42	3453	116 47 59	3449
	α Arietis	W.	85 57 11	3192	87 23 30	3188	88 49 53	3184	90 16 21	3180
	Aldebaran	W.	54 50 55	3077	56 19 33	3073	57 48 16	3069	59 17 4	3064
	Spica	E.	79 55 14	3092	78 26 55	3089	76 58 33	3086	75 30 6	3083
31	Sun	W.	123 35 38	3423	124 57 28	3417	126 19 25	3410	127 41 30	3404
	Aldebaran	W.	66 42 33	3037	68 12 0	3030	69 41 36	3023	71 11 20	3016
	Spica	E.	68 6 40	3059	66 37 41	3053	65 8 35	3048	63 39 22	3042

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
22	Sun	W.	27° 50′ 47″	2902	29° 23′ 3″	2913	30° 55′ 6″	2924	32° 26′ 54″	2938
	Pollux	E.	82 24 6	2511	80 43 8	2527	79 2 32	2543	77 22 19	2559
23	Sun	W.	40 1 42	3008	41 31 45	3023	43 1 30	3038	44 30 56	3054
	Pollux	E.	69 6 51	2642	67 28 53	2658	65 51 17	2675	64 14 3	2692
24	Sun	W.	51 53 15	3132	53 20 46	3147	54 47 58	3162	56 14 52	3178
	Pollux	E.	56 13 26	2773	54 38 23	2789	53 3 41	2805	51 29 19	2821
	Regulus	E.	92 10 21	2762	90 35 4	2778	89 0 8	2793	87 25 31	2808
25	Sun	W.	63 24 54	3251	64 50 3	3264	66 14 57	3277	67 39 35	3290
	α Arietis	W.	34 26 54	3262	35 51 27	3264	37 16 20	3252	38 41 28	3241
	Pollux	E.	43 42 35	2897	42 10 12	2912	40 38 9	2927	39 6 25	2942
	Saturn	E.	79 20 52	2853	77 47 33	2866	76 14 30	2879	74 41 44	2891
	Regulus	E.	79 37 7	2878	78 4 20	2890	76 31 49	2904	74 59 35	2916
26	Sun	W.	74 39 8	3349	76 2 23	3360	77 25 25	3370	78 48 16	3379
	α Arietis	W.	45 49 38	3213	47 15 32	3210	48 41 29	3209	50 7 27	3208
	Pollux	E.	31 32 16	3014	30 2 20	3029	28 32 43	3045	27 3 26	3062
	Saturn	E.	67 1 40	2947	65 30 21	2957	63 59 15	2967	62 28 21	2976
	Regulus	E.	67 22 13	2973	65 51 27	2983	64 20 53	2993	62 50 32	3002
27	Sun	W.	85 39 56	3421	87 1 49	3427	88 23 35	3434	89 45 13	3439
	α Arietis	W.	57 17 23	3209	58 43 21	3210	60 9 18	3211	61 35 14	3211
	Aldebaran	W.	25 22 10	3078	26 50 46	3079	28 19 21	3081	29 47 54	3082
	Pollux	E.	19 42 30	3162	18 15 35	3191	16 49 15	3228	15 23 40	3275
	Saturn	E.	54 56 33	3016	53 26 40	3023	51 56 56	3029	50 27 19	3035
	Regulus	E.	55 21 31	3043	53 52 12	3050	52 23 2	3057	50 54 0	3063
	Spica	E.	109 22 22	3060	107 53 24	3067	106 24 34	3071	104 55 49	3076
28	Sun	W.	96 31 59	3461	97 53 7	3463	99 14 12	3465	100 35 15	3468
	α Arietis	W.	68 44 48	3213	70 10 42	3212	71 36 37	3212	73 2 32	3210
	Aldebaran	W.	37 10 9	3091	38 38 30	3091	40 6 51	3091	41 35 11	3091
	Saturn	E.	43 0 50	3056	41 31 47	3060	40 2 48	3063	38 33 53	3065
	Regulus	E.	43 30 30	3087	42 2 5	3091	40 33 44	3095	39 5 28	3098
	Spica	E.	97 33 27	3095	96 5 11	3096	94 36 57	3097	93 8 46	3099
29	Sun	W.	107 20 11	3468	108 41 11	3467	110 2 12	3465	111 23 15	3462
	α Arietis	W.	80 12 30	3203	81 38 36	3201	83 4 44	3198	84 30 56	3195
	Aldebaran	W.	48 56 56	3087	50 25 21	3085	51 53 49	3082	53 22 21	3080
	Saturn	E.	31 9 47	3071	29 41 2	3072	28 12 17	3072	26 43 33	3073
	Regulus	E.	31 44 57	3110	30 16 59	3112	28 49 3	3114	27 21 10	3118
	Spica	E.	85 48 2	3099	84 19 53	3099	82 51 42	3097	81 23 29	3095
30	Sun	W.	118 9 20	3445	119 30 46	3440	120 52 17	3435	122 13 54	3429
	α Arietis	W.	91 42 54	3176	93 9 32	3172	94 36 15	3167	96 3 4	3162
	Aldebaran	W.	60 45 57	3060	62 14 56	3055	63 44 1	3049	65 13 13	3043
	Spica	E.	74 1 35	3079	72 33 0	3075	71 4 19	3070	69 35 33	3064
31	Sun	W.	129 3 42	3397	130 26 2	3389	131 48 31	3381	133 11 9	3374
	Aldebaran	W.	72 41 13	3009	74 11 15	3001	75 41 27	2993	77 11 49	2984
	Spica	E.	62 10 1	3036	60 40 33	3029	59 10 56	3022	57 41 11	3015

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to / Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Tues.	1	0 43 6.06	9.096	N. 4 38 14.8	+57.78	16 2.08	64.51	3 54.32	0.758
Wed.	2	0 46 44.43	9.101	5 1 18.9	57.56	16 1.81	64.53	3 36.20	0.753
Thur.	3	0 50 22.93	9.107	5 24 17.6	57.33	16 1.53	64.55	3 18.20	0.747
Frid.	4	0 54 1.58	9.113	5 47 10.5	+57.08	16 1.25	64.58	3 0.33	0.741
Sat.	5	0 57 40.39	9.121	6 9 57.4	56.82	16 0.97	64.60	2 42.63	0.733
SUN.	6	1 1 19.39	9.129	6 32 37.9	56.55	16 0.70	64.63	2 25.13	0.725
Mon.	7	1 4 58.61	9.139	6 55 11.7	+56.27	16 0.42	64.66	2 7.84	0.715
Tues.	8	1 8 38.06	9.149	7 17 38.5	55.97	16 0.14	64.70	1 50.79	0.705
Wed.	9	1 12 17.76	9.160	7 39 57.9	55.66	15 59.86	64.73	1 33.59	0.694
Thur.	10	1 15 57.74	9.172	8 2 9.7	+55.33	15 59.59	64.77	1 17.46	0.682
Frid.	11	1 19 38.02	9.184	8 24 13.6	54.99	15 59.31	64.81	1 1.22	0.670
Sat.	12	1 23 18.60	9.197	8 46 9.3	54.64	15 59.04	64.86	0 45.30	0.657
SUN.	13	1 26 59.51	9.211	9 7 56.2	+54.27	15 58.76	64.90	0 29.70	0.643
Mon.	14	1 30 40.76	9.226	9 29 34.1	53.89	15 58.49	64.95	0 14.44	0.628
Tues.	15	1 34 22.37	9.241	9 51 2.9	53.50	15 58.21	65.00	0 0.46	0.613
Wed.	16	1 38 4.35	9.257	10 12 22.0	+53.09	15 57.94	65.06	0 15.00	0.597
Thur.	17	1 41 46.71	9.274	10 33 31.1	52.66	15 57.67	65.11	0 29.16	0.581
Frid.	18	1 45 29.46	9.291	10 54 29.8	52.22	15 57.41	65.17	0 42.92	0.564
Sat.	19	1 49 12.62	9.308	11 15 17.9	+51.77	15 57.15	65.23	0 56.28	0.547
SUN.	20	1 52 56.20	9.325	11 35 54.9	51.30	15 56.89	65.29	1 9.22	0.530
Mon.	21	1 56 40.20	9.343	11 56 20.4	50.82	15 56.63	65.35	1 21.74	0.512
Tues.	22	2 0 24.63	9.361	12 16 34.1	+50.32	15 56.38	65.42	1 33.83	0.494
Wed.	23	2 4 9.51	9.380	12 36 35.7	49.81	15 56.13	65.49	1 45.48	0.475
Thur.	24	2 7 54.84	9.399	12 56 24.9	49.28	15 55.88	65.56	1 56.68	0.456
Frid.	25	2 11 40.62	9.418	13 16 1.3	+48.74	15 55.63	65.63	2 7.41	0.437
Sat.	26	2 15 26.88	9.438	13 35 24.4	48.18	15 55.39	65.70	2 17.67	0.417
SUN.	27	2 19 13.63	9.458	13 54 34.1	47.62	15 55.15	65.77	2 27.45	0.397
Mon.	28	2 23 0.86	9.478	14 13 30.0	+47.04	15 54.91	65.85	2 36.75	0.377
Tues.	29	2 26 48.58	9.499	14 32 11.9	46.45	15 54.67	65.92	2 45.55	0.356
Wed.	30	2 30 36.82	9.520	14 50 39.3	45.84	15 54.44	66.00	2 53.85	0.335
Thur.	31	2 34 25.58	9.542	N.15 8 52.0	+45.21	15 54.21	66.08	3 1.63	0.313

NOTE.—The mean time of semidiameter passing may be found by subtracting 0ˢ.18 from the sidereal time.

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from / Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Tues.	1	0 43 5.46	9.098	N. 4 38 11.0	+57.79	3 54.37	0.758	0 39 11.09
Wed.	2	0 46 43.88	9.103	5 1 15.4	57.57	3 36.24	0.753	0 43 7.64
Thur.	3	0 50 22.43	9.109	5 24 14.4	57.34	3 18.24	0.747	0 47 4.19
Frid.	4	0 54 1.12	9.115	5 47 7.6	+57.09	3 0.37	0.741	0 51 0.75
Sat.	5	0 57 39.97	9.123	6 9 54.8	56.83	2 42.67	0.733	0 54 57.30
SUN.	6	1 1 19.02	9.131	6 32 35.6	56.56	2 25.16	0.725	0 58 53.86
Mon.	7	1 4 58.29	9.141	6 55 9.7	+56.28	2 7.87	0.715	1 2 50.41
Tues.	8	1 8 37.78	9.151	7 17 36.8	55.98	1 50.82	0.705	1 6 46.96
Wed.	9	1 12 17.52	9.162	7 39 56.5	55.67	1 34.01	0.694	1 10 43.51
Thur.	10	1 15 57.54	9.174	8 2 8.6	+55.34	1 17.47	0.682	1 14 40.07
Frid.	11	1 19 37.86	9.186	8 24 12.7	55.00	1 1.23	0.670	1 18 36.62
Sat.	12	1 23 18.48	9.199	8 46 8.6	54.65	0 45.30	0.657	1 22 33.18
SUN.	13	1 26 59.43	9.213	9 7 55.8	+54.28	0 29.70	0.643	1 26 29.73
Mon.	14	1 30 40.72	9.228	9 29 34.0	53.90	0 14.44	0.628	1 30 26.28
Tues.	15	1 34 22.37	9.243	9 51 2.9	53.51	0 0.46	0.613	1 34 22.83
Wed.	16	1 38 4.39	9.259	10 12 22.2	+53.10	0 15.00	0.597	1 38 19.39
Thur.	17	1 41 46.78	9.275	10 33 31.5	52.67	0 29.16	0.581	1 42 15.94
Frid.	18	1 45 29.57	9.292	10 54 30.4	52.23	0 42.93	0.564	1 46 12.50
Sat.	19	1 49 12.77	9.309	11 15 18.6	+51.78	0 56.29	0.547	1 50 9.05
SUN.	20	1 52 56.38	9.326	11 35 55.8	51.31	1 9.23	0.530	1 54 5.61
Mon.	21	1 56 40.41	9.344	11 56 21.5	50.83	1 21.75	0.512	1 58 2.16
Tues.	22	2 0 24.87	9.362	12 16 35.4	+50.33	1 33.84	0.494	2 1 58.72
Wed.	23	2 4 9.78	9.381	12 36 37.2	49.82	1 45.49	0.475	2 5 55.27
Thur.	24	2 7 55.14	9.400	12 56 26.5	49.29	1 56.69	0.456	2 9 51.83
Frid.	25	2 11 40.95	9.419	13 16 3.0	+48.75	2 7.43	0.437	2 13 48.38
Sat.	26	2 15 27.24	9.439	13 35 26.3	48.19	2 17.69	0.417	2 17 44.93
SUN.	27	2 19 14.01	9.459	13 54 36.1	47.62	2 27.47	0.397	2 21 41.48
Mon.	28	2 23 1.27	9.479	14 13 32.1	+47.04	2 36.77	0.377	2 25 38.04
Tues.	29	2 26 49.02	9.500	14 32 14.0	46.45	2 45.57	0.356	2 29 34.59
Wed.	30	2 30 37.28	9.521	14 50 41.5	45.84	2 53.87	0.335	2 33 31.15
Thur.	31	2 34 26.06	9.543	N. 15 8 54.2	+45.21	3 1.65	0.313	2 37 27.70

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

Diff. for 1 hour, + 9s.8565. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	91	11 43 22.6	43 27.9	147.80	+ 0.73	9.9999626	+51.4	23 16 59.42
2	92	12 42 28.7	42 33.9	147.71	0.78	0.0000862	51.6	23 13 3.51
3	93	13 41 32.6	41 37.7	147.62	0.80	0.0002102	51.8	23 9 7.60
4	94	14 40 34.4	40 39.4	147.53	+ 0.78	0.0003347	+52.0	23 5 11.69
5	95	15 39 34.1	39 39.0	147.44	0.74	0.0004596	52.2	23 1 15.79
6	96	16 38 31.8	38 36.6	147.36	0.67	0.0005849	52.3	22 57 19.88
7	97	17 37 27.6	37 32.3	147.28	+ 0.57	0.0007106	+52.4	22 53 23.97
8	98	18 36 21.5	36 26.1	147.21	0.46	0.0008365	52.5	22 49 28.06
9	99	19 35 13.6	35 18.1	147.13	0.33	0.0009625	52.5	22 45 32.16
10	100	20 34 4.0	34 8.3	147.06	+ 0.19	0.0010885	+52.4	22 41 36.25
11	101	21 32 52.6	32 56.8	146.99	+ 0.06	0.0012143	52.2	22 37 40.34
12	102	22 31 39.5	31 43.6	146.92	— 0.06	0.0013397	52.1	22 33 44.43
13	103	23 30 24.7	30 28.7	146.85	— 0.17	0.0014646	+51.9	22 29 48.53
14	104	24 29 8.2	29 12.1	146.77	0.26	0.0015889	51.6	22 25 52.62
15	105	25 27 49.9	27 53.7	146.70	0.33	0.0017124	51.3	22 21 56.71
16	106	26 26 29.9	26 33.6	146.63	— 0.37	0.0018350	+50.9	22 18 0.80
17	107	27 25 8.1	25 11.7	146.56	0.37	0.0019565	50.4	22 14 4.90
18	108	28 23 44.6	23 48.1	146.48	0.35	0.0020768	49.9	22 10 8.99
19	109	29 22 19.2	22 22.6	146.40	— 0.30	0.0021958	+49.4	22 6 13.08
20	110	30 20 51.9	20 55.1	146.32	0.22	0.0023135	48.8	22 2 17.18
21	111	31 19 22.6	19 25.7	146.24	— 0.12	0.0024299	48.3	21 58 21.27
22	112	32 17 51.4	17 54.4	146.15	0.00	0.0025449	+47.7	21 54 25.36
23	113	33 16 18.1	16 21.0	146.07	+ 0.13	0.0026586	47.2	21 50 29.45
24	114	34 14 42.7	14 45.5	145.98	0.27	0.0027711	46.6	21 46 33.54
25	115	35 13 5.3	13 7.9	145.90	+ 0.40	0.0028824	+46.1	21 42 37.63
26	116	36 11 25.7	11 28.2	145.81	0.52	0.0029926	45.7	21 38 41.72
27	117	37 9 44.0	9 46.4	145.73	0.62	0.0031018	45.3	21 34 45.81
28	118	38 8 0.3	8 2.6	145.64	+ 0.70	0.0032101	+45.0	21 30 49.90
29	119	39 6 14.6	6 16.7	145.56	0.75	0.0033176	44.7	21 26 54.00
30	120	40 4 26.8	4 28.8	145.47	0.77	0.0034244	44.4	21 22 58.09
31	121	41 2 37.1	2 39.0	145.39	+ 0.76	0.0035306	+44.1	21 19 2.18

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January $0^{d}.0$.

Diff. for 1 Hour,
— $9^{s}.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 56.5	14 59.8	54 43.4	+0.94	54 55.5	+1.07	9 39.4	1.89	11.6
2	15 3.5	15 7.5	55 9.1	1.18	55 23.9	1.28	10 24.2	1.85	12.6
3	15 11.8	15 16.3	55 39.7	1.36	55 56.2	1.39	11 8.4	1.84	13.6
4	15 20.9	15 25.5	56 13.1	+1.41	56 30.1	+1.42	11 52.8	1.87	14.6
5	15 30.2	15 34.7	56 47.1	1.40	57 3.7	1.36	12 38.1	1.93	15.6
6	15 39.0	15 43.2	57 19.7	1.31	57 35.0	1.24	13 25.5	2.03	16.6
7	15 47.2	15 50.8	57 49.5	+1.16	58 3.0	+1.08	14 15.4	2.15	17.6
8	15 54.2	15 57.3	58 15.4	0.99	58 26.7	0.90	15 8.6	2.29	18.6
9	16 0.1	16 2.5	58 36.9	0.80	58 46.0	0.71	16 5.2	2.41	19.6
10	16 4.7	16 6.6	58 54.0	+0.62	59 0.9	+0.53	17 4.4	2.49	20.6
11	16 8.2	16 9.5	59 6.8	0.44	59 11.6	0.35	18 4.8	2.50	21.6
12	16 10.5	16 11.2	59 15.2	0.26	59 17.7	+0.16	19 4.5	2.44	22.6
13	16 11.5	16 11.5	59 19.0	+0.05	59 18.9	−0.07	20 1.9	2.33	23.6
14	16 11.1	16 10.3	59 17.4	−0.19	59 14.4	0.32	20 56.4	2.21	24.6
15	16 9.0	16 7.3	59 9.8	0.46	59 3.4	0.61	21 48.0	2.11	25.6
16	16 5.0	16 2.3	58 55.2	−0.75	58 45.3	−0.90	22 37.5	2.03	26.6
17	15 59.2	15 55.5	58 33.6	1.05	58 20.1	1.19	23 25.5	1.98	27.6
18	15 51.4	15 46.9	58 5.1	1.31	57 48.7	1.42	6		28.6
19	15 42.1	15 37.1	57 31.1	−1.51	57 12.6	−1.57	0 13.0	1.98	0.2
20	15 31.9	15 26.7	56 53.5	1.60	56 34.2	1.61	1 0.8	2.02	1.2
21	15 21.4	15 16.3	56 14.9	1.59	55 56.1	1.54	1 49.4	2.04	2.2
22	15 11.4	15 6.8	55 38.1	−1.46	55 21.2	−1.35	2 39.0	2.08	3.2
23	15 2.6	14 58.8	55 5.7	1.22	54 51.9	1.08	3 29.3	2.10	4.2
24	14 55.5	14 52.9	54 39.9	0.91	54 30.1	0.72	4 19.9	2.10	5.2
25	14 50.8	14 49.4	54 22.6	−0.53	54 17.5	−0.32	5 10.1	2.07	6.2
26	14 48.8	14 48.8	54 15.0	−0.10	54 15.0	+0.11	5 59.2	2.01	7.2
27	14 49.5	14 50.9	54 17.7	+0.33	54 22.9	0.54	6 46.8	1.95	8.2
28	14 53.0	14 55.8	54 30.7	+0.75	54 40.9	+0.95	7 32.9	1.89	9.2
29	14 59.2	15 3.2	54 53.4	1.13	55 8.1	1.30	8 17.6	1.85	10.2
30	15 7.7	15 12.7	55 24.7	1.45	55 42.8	1.57	9 1.6	1.83	11.2
31	15 18.0	15 23.6	56 2.4	+1.68	56 23.1	+1.75	9 45.6	1.85	12.2

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 1.					**THURSDAY 3.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	10 0 51.57	2.0087	N.16 46 22.6	9.203	0	11 35 33.86	1.9503	N. 8 5 16.0	12.240
1	10 2 52.04	2.0067	16 37 8.0	9.282	1	11 37 30.87	1.9501	7 53 0.2	12.286
2	10 4 52.39	2.0049	16 27 48.7	9.361	2	11 39 27.87	1.9499	7 40 41.7	12.330
3	10 6 52.63	2.0031	16 18 24.7	9.439	3	11 41 24.86	1.9497	7 28 20.6	12.373
4	10 8 52.76	2.0012	16 8 56.0	9.516	4	11 43 21.84	1.9496	7 15 56.9	12.416
5	10 10 52.78	1.9994	15 59 22.8	9.592	5	11 45 18.81	1.9495	7 3 30.7	12.458
6	10 12 52.69	1.9976	15 49 45.0	9.668	6	11 47 15.78	1.9495	6 51 2.0	12.499
7	10 14 52.49	1.9958	15 40 2.6	9.744	7	11 49 12.75	1.9495	6 38 30.8	12.540
8	10 16 52.19	1.9941	15 30 15.7	9.818	8	11 51 9.72	1.9495	6 25 57.2	12.579
9	10 18 51.78	1.9923	15 20 24.4	9.892	9	11 53 6.69	1.9496	6 13 21.3	12.617
10	10 20 51.27	1.9906	15 10 28.7	9.965	10	11 55 3.67	1.9498	6 0 43.1	12.655
11	10 22 50.66	1.9889	15 0 28.6	10.038	11	11 57 0.66	1.9500	5 48 2.7	12.692
12	10 24 49.94	1.9872	14 50 24.1	10.111	12	11 58 57.67	1.9502	5 35 20.1	12.728
13	10 26 49.12	1.9856	14 40 15.3	10.182	13	12 0 54.69	1.9505	5 22 35.3	12.764
14	10 28 48.21	1.9841	14 30 2.2	10.253	14	12 2 51.73	1.9509	5 9 48.4	12.798
15	10 30 47.21	1.9826	14 19 44.9	10.323	15	12 4 48.80	1.9514	4 56 59.5	12.832
16	10 32 46.12	1.9810	14 9 23.4	10.392	16	12 6 45.90	1.9519	4 44 8.6	12.864
17	10 34 44.93	1.9794	13 58 57.8	10.461	17	12 8 43.03	1.9524	4 31 15.8	12.896
18	10 36 43.65	1.9779	13 48 28.1	10.529	18	12 10 40.19	1.9530	4 18 21.1	12.927
19	10 38 42.28	1.9765	13 37 54.3	10.597	19	12 12 37.39	1.9536	4 5 24.6	12.957
20	10 40 40.83	1.9751	13 27 16.5	10.664	20	12 14 34.62	1.9542	3 52 26.3	12.986
21	10 42 39.29	1.9737	13 16 34.7	10.730	21	12 16 31.89	1.9549	3 39 26.3	13.014
22	10 44 37.67	1.9723	13 5 48.9	10.795	22	12 18 29.21	1.9557	3 26 24.6	13.042
23	10 46 35.97	1.9710	N.12 54 59.3	10.859	23	12 20 26.58	1.9565	N. 3 13 21.3	13.068
	WEDNESDAY 2.					**FRIDAY 4.**			
0	10 48 34.19	1.9697	N.12 44 5.8	10.923	0	12 22 23.99	1.9573	N. 3 0 16.5	13.093
1	10 50 32.33	1.9684	12 33 8.5	10.987	1	12 24 21.46	1.9583	2 47 10.2	13.118
2	10 52 30.40	1.9672	12 22 7.4	11.049	2	12 26 18.99	1.9593	2 34 2.4	13.142
3	10 54 28.40	1.9661	12 11 2.6	11.111	3	12 28 16.58	1.9604	2 20 53.2	13.164
4	10 56 26.33	1.9649	11 59 54.1	11.172	4	12 30 14.24	1.9616	2 7 42.7	13.185
5	10 58 24.19	1.9638	11 48 41.9	11.233	5	12 32 11.97	1.9627	1 54 31.0	13.205
6	11 0 21.99	1.9627	11 37 26.1	11.293	6	12 34 9.76	1.9639	1 41 18.1	13.225
7	11 2 19.72	1.9617	11 26 6.7	11.352	7	12 36 7.63	1.9651	1 28 4.0	13.244
8	11 4 17.39	1.9607	11 14 43.8	11.410	8	12 38 5.58	1.9664	1 14 48.8	13.262
9	11 6 15.01	1.9598	11 3 17.5	11.467	9	12 40 3.60	1.9677	1 1 32.5	13.279
10	11 8 12.57	1.9588	10 51 47.7	11.524	10	12 42 1.71	1.9692	0 48 15.3	13.295
11	11 10 10.07	1.9579	10 40 14.6	11.580	11	12 43 59.91	1.9707	0 34 57.1	13.310
12	11 12 7.52	1.9571	10 28 38.1	11.636	12	12 45 58.20	1.9723	0 21 38.1	13.324
13	11 14 4.93	1.9564	10 16 58.3	11.691	13	12 47 56.59	1.9739	N. 0 8 18.3	13.337
14	11 16 2.29	1.9556	10 5 15.2	11.745	14	12 49 55.07	1.9755	S. 0 5 2.3	13.348
15	11 17 59.60	1.9548	9 53 28.9	11.797	15	12 51 53.65	1.9772	0 18 23.5	13.358
16	11 19 56.87	1.9542	9 41 39.5	11.849	16	12 53 52.34	1.9790	0 31 45.3	13.368
17	11 21 54.10	1.9536	9 29 47.0	11.901	17	12 55 51.13	1.9808	0 45 7.7	13.377
18	11 23 51.30	1.9530	9 17 51.4	11.952	18	12 57 50.03	1.9827	0 58 30.6	13.385
19	11 25 48.46	1.9524	9 5 52.8	12.002	19	12 59 49.05	1.9847	1 11 53.9	13.392
20	11 27 45.59	1.9520	8 53 51.2	12.052	20	13 1 48.19	1.9866	1 25 17.6	13.397
21	11 29 42.70	1.9516	8 41 46.6	12.100	21	13 3 47.44	1.9886	1 38 41.6	13.402
22	11 31 39.78	1.9511	8 29 39.2	12.147	22	13 5 46.82	1.9908	1 52 5.8	13.405
23	11 33 36.83	1.9507	8 17 29.0	12.193	23	13 7 46.33	1.9930	2 5 30.2	13.408
24	11 35 33.86	1.9503	N. 8 5 16.0	12.240	24	13 9 45.98	1.9952	S. 2 18 54.8	13.410

GREENWICH MEAN TIME

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 5.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	13 9 45.98	1.9952	S. 2 18 54.8	13.410
1	13 11 45.76	1.9975	2 32 19.4	13.410
2	13 13 45.68	1.9998	2 45 44.0	13.409
3	13 15 45.73	2.0021	2 59 8.5	13.407
4	13 17 45.93	2.0046	3 12 32.8	13.404
5	13 19 46.28	2.0072	3 25 56.9	13.400
6	13 21 46.79	2.0097	3 39 20.8	13.395
7	13 23 47.45	2.0123	3 52 44.3	13.388
8	13 25 48.27	2.0150	4 6 7.4	13.381
9	13 27 49.25	2.0177	4 19 30.0	13.372
10	13 29 50.39	2.0205	4 32 52.1	13.363
11	13 31 51.71	2.0234	4 46 13.6	13.352
12	13 33 53.20	2.0263	4 59 34.4	13.341
13	13 35 54.86	2.0293	5 12 54.5	13.328
14	13 37 56.71	2.0323	5 26 13.7	13.313
15	13 39 58.74	2.0353	5 39 32.0	13.298
16	13 42 0.95	2.0384	5 52 49.4	13.281
17	13 44 3.35	2.0416	6 6 5.7	13.262
18	13 46 5.95	2.0449	6 19 20.9	13.243
19	13 48 8.74	2.0483	6 32 34.9	13.223
20	13 50 11.74	2.0517	6 45 47.7	13.202
21	13 52 14.94	2.0550	6 58 59.2	13.180
22	13 54 18.34	2.0584	7 12 9.3	13.156
23	13 56 21.95	2.0620	S. 7 25 17.9	13.131

SUNDAY 6.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	13 58 25.78	2.0656	S. 7 38 25.0	13.104
1	14 0 29.82	2.0692	7 51 30.4	13.076
2	14 2 34.06	2.0729	8 4 34.1	13.047
3	14 4 38.57	2.0767	8 17 36.1	13.018
4	14 6 43.28	2.0804	8 30 36.3	12.987
5	14 8 48.22	2.0842	8 43 34.6	12.955
6	14 10 53.38	2.0880	8 56 30.9	12.921
7	14 12 58.78	2.0920	9 9 25.1	12.885
8	14 15 4.42	2.0961	9 22 17.1	12.849
9	14 17 10.31	2.1002	9 35 7.0	12.812
10	14 19 16.44	2.1042	9 47 54.6	12.773
11	14 21 22.82	2.1083	10 0 39.8	12.732
12	14 23 29.44	2.1125	10 13 22.5	12.691
13	14 25 36.32	2.1167	10 26 2.7	12.649
14	14 27 43.45	2.1210	10 38 40.4	12.605
15	14 29 50.84	2.1253	10 51 15.3	12.559
16	14 31 58.49	2.1297	11 3 47.4	12.512
17	14 34 6.41	2.1342	11 16 16.7	12.464
18	14 36 14.60	2.1387	11 28 43.1	12.415
19	14 38 23.06	2.1432	11 41 6.5	12.364
20	14 40 31.79	2.1477	11 53 26.8	12.312
21	14 42 40.79	2.1523	12 5 43.9	12.258
22	14 44 50.07	2.1570	12 17 57.8	12.204
23	14 46 59.63	2.1617	12 30 8.4	12.147
24	14 49 9.47	2.1664	S. 12 42 15.5	12.089

MONDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	14 49 9.47	2.1664	S. 12 42 15.5	12.089
1	14 51 19.60	2.1712	12 54 19.1	12.031
2	14 53 30.02	2.1760	13 6 19.2	11.972
3	14 55 40.72	2.1808	13 18 15.7	11.910
4	14 57 51.72	2.1857	13 30 8.4	11.847
5	15 0 3.01	2.1907	13 41 57.3	11.783
6	15 2 14.60	2.1957	13 53 42.3	11.717
7	15 4 26.49	2.2007	14 5 23.3	11.649
8	15 6 38.68	2.2057	14 17 0.2	11.581
9	15 8 51.17	2.2107	14 28 33.0	11.512
10	15 11 3.96	2.2157	14 40 1.6	11.440
11	15 13 17.05	2.2208	14 51 25.8	11.367
12	15 15 30.45	2.2259	15 2 45.6	11.293
13	15 17 44.16	2.2311	15 14 0.9	11.218
14	15 19 58.18	2.2363	15 25 11.7	11.141
15	15 22 12.52	2.2416	15 36 17.8	11.062
16	15 24 27.17	2.2468	15 47 19.2	10.983
17	15 26 42.13	2.2520	15 58 15.8	10.902
18	15 28 57.41	2.2573	16 9 7.4	10.819
19	15 31 13.01	2.2626	16 19 54.0	10.735
20	15 33 28.93	2.2679	16 30 35.6	10.651
21	15 35 45.16	2.2732	16 41 12.1	10.564
22	15 38 1.71	2.2785	16 51 43.3	10.476
23	15 40 18.58	2.2839	S. 17 2 9.2	10.386

TUESDAY 8.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	15 42 35.78	2.2893	S. 17 12 29.6	10.294
1	15 44 53.30	2.2947	17 22 44.5	10.202
2	15 47 11.14	2.3000	17 32 53.9	10.110
3	15 49 29.30	2.3054	17 42 57.7	10.015
4	15 51 47.79	2.3108	17 52 55.7	9.918
5	15 54 6.60	2.3162	18 2 47.9	9.821
6	15 56 25.73	2.3215	18 12 34.2	9.722
7	15 58 45.18	2.3269	18 22 14.5	9.621
8	16 1 4.96	2.3323	18 31 48.7	9.518
9	16 3 25.06	2.3377	18 41 16.7	9.415
10	16 5 45.48	2.3431	18 50 38.5	9.311
11	16 8 6.23	2.3485	18 59 54.0	9.204
12	16 10 27.30	2.3538	19 9 3.0	9.096
13	16 12 48.69	2.3592	19 18 5.5	8.987
14	16 15 10.40	2.3645	19 27 1.5	8.878
15	16 17 32.43	2.3697	19 35 50.9	8.767
16	16 19 54.77	2.3750	19 44 33.5	8.654
17	19 22 17.43	2.3803	19 53 9.3	8.540
18	16 24 40.41	2.3856	20 1 38.3	8.425
19	16 27 3.70	2.3908	20 10 0.3	8.308
20	16 29 27.31	2.3961	20 18 15.2	8.189
21	16 31 51.23	2.4012	20 26 23.0	8.070
22	16 34 15.46	2.4063	20 34 23.6	7.949
23	16 36 39.99	2.4114	20 42 16.9	7.827
24	16 39 4.83	2.4165	S. 20 50 2.8	7.703

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 9.					**FRIDAY 11.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	16 39 4.83	2.4165	S.20 50 2.8	7.703	0	18 39 43.29	2.5772	S.24 17 34.1	0.625
1	16 41 29.98	2.4216	20 57 41.3	7.579	1	18 42 17.95	2.5781	24 18 6.7	0.462
2	16 43 55.42	2.4265	21 5 12.3	7.454	2	18 44 52.66	2.5788	24 18 29.5	0.298
3	16 46 21.16	2.4314	21 12 35.8	7.327	3	18 47 27.41	2.5795	24 18 42.5	− 0.135
4	16 48 47.19	2.4363	21 19 51.6	7.199	4	18 50 2.20	2.5801	24 18 45.7	+ 0.028
5	16 51 13.52	2.4412	21 26 59.7	7.069	5	18 52 37.02	2.5806	24 18 39.1	0.191
6	16 53 40.14	2.4460	21 33 59.9	6.938	6	18 55 11.87	2.5810	24 18 22.8	0.354
7	16 56 7.04	2.4508	21 40 52.3	6.807	7	18 57 46.74	2.5812	24 17 56.6	0.518
8	16 58 34.23	2.4555	21 47 36.8	6.675	8	19 0 21.62	2.5813	24 17 20.6	0.682
9	17 1 1.70	2.4601	21 54 13.3	6.541	9	19 2 56.50	2.5812	24 16 34.8	0.846
10	17 3 29.44	2.4647	22 0 41.7	6.405	10	19 5 31.37	2.5811	24 15 39.1	1.009
11	17 5 57.46	2.4693	22 7 1.9	6.269	11	19 8 6.23	2.5808	24 14 33.7	1.173
12	17 8 25.75	2.4738	22 13 13.9	6.132	12	19 10 41.07	2.5805	24 13 18.5	1.335
13	17 10 54.31	2.4782	22 19 17.7	5.993	13	19 13 15.89	2.5800	24 11 53.5	1.498
14	17 13 23.13	2.4824	22 25 13.1	5.853	14	19 15 50.67	2.5793	24 10 18.7	1.662
15	17 15 52.20	2.4867	22 31 0.1	5.713	15	19 18 25.41	2.5786	24 8 34.1	1.825
16	17 18 21.53	2.4909	22 36 38.7	5.572	16	19 21 0.11	2.5778	24 6 39.7	1.987
17	17 20 51.11	2.4950	22 42 8.7	5.429	17	19 23 34.75	2.5768	24 4 35.6	2.149
18	17 23 20.93	2.4990	22 47 30.1	5.285	18	19 26 9.33	2.5757	24 2 21.8	2.311
19	17 25 50.99	2.5030	22 52 42.9	5.141	19	19 28 43.84	2.5746	23 59 58.2	2.473
20	17 28 21.29	2.5070	22 57 47.0	4.995	20	19 31 18.28	2.5733	23 57 25.0	2.634
21	17 30 51.83	2.5108	23 2 42.3	4.848	21	19 33 52.64	2.5719	23 54 42.1	2.796
22	17 33 22.59	2.5145	23 7 28.8	4.701	22	19 36 26.91	2.5704	23 51 49.5	2.957
23	17 35 53.57	2.5181	S.23 12 6.5	4.553	23	19 39 1.09	2.5688	S.23 48 47.3	3.117
	THURSDAY 10.					**SATURDAY 12.**			
0	17 38 24.76	2.5216	S.23 16 35.2	4.403	0	19 41 35.17	2.5671	S.23 45 35.5	3.277
1	17 40 56.16	2.5251	23 20 54.9	4.253	1	19 44 9.14	2.5652	23 42 14.1	3.436
2	17 43 27.77	2.5286	23 25 5.6	4.102	2	19 46 43.00	2.5633	23 38 43.2	3.594
3	17 45 59.59	2.5319	23 29 7.2	3.951	3	19 49 16.74	2.5612	23 35 2.8	3.752
4	17 48 31.60	2.5351	23 32 59.7	3.799	4	19 51 50.35	2.5591	23 31 12.9	3.910
5	17 51 3.80	2.5382	23 36 43.0	3.646	5	19 54 23.83	2.5568	23 27 13.6	4.067
6	17 53 36.18	2.5411	23 40 17.2	3.492	6	19 56 57.17	2.5545	23 23 4.8	4.224
7	17 56 8.73	2.5440	23 43 42.1	3.337	7	19 59 30.37	2.5521	23 18 46.7	4.379
8	17 58 41.46	2.5469	23 46 57.7	3.182	8	20 2 3.42	2.5496	23 14 19.3	4.534
9	18 1 14.36	2.5497	23 50 3.9	3.026	9	20 4 36.32	2.5470	23 9 42.6	4.689
10	18 3 47.42	2.5523	23 53 0.8	2.869	10	20 7 9.06	2.5442	23 4 56.6	4.843
11	18 6 20.63	2.5547	23 55 48.2	2.712	11	20 9 41.63	2.5413	23 0 1.4	4.997
12	18 8 53.98	2.5570	23 58 26.2	2.554	12	20 12 14.02	2.5384	22 54 57.0	5.149
13	18 11 27.47	2.5593	24 0 54.7	2.396	13	20 14 46.24	2.5355	22 49 43.5	5.300
14	18 14 1.10	2.5616	24 3 13.7	2.237	14	20 17 18.28	2.5324	22 44 21.0	5.450
15	18 16 34.86	2.5637	24 5 23.2	2.078	15	20 19 50.13	2.5292	22 38 49.5	5.600
16	18 19 8.74	2.5656	24 7 23.1	1.918	16	20 22 21.79	2.5260	22 33 9.0	5.749
17	18 21 42.73	2.5674	24 9 13.3	1.757	17	20 24 53.25	2.5227	22 27 19.6	5.897
18	18 24 16.83	2.5692	24 10 53.9	1.596	18	20 27 24.52	2.5194	22 21 21.3	6.045
19	18 26 51.03	2.5708	24 12 24.8	1.435	19	20 29 55.58	2.5159	22 15 14.2	6.191
20	18 29 25.32	2.5723	24 13 46.1	1.274	20	20 32 26.42	2.5123	22 8 58.4	6.336
21	18 31 59.70	2.5737	24 14 57.7	1.112	21	20 34 57.05	2.5087	22 2 33.9	6.481
22	18 34 34.16	2.5749	24 15 59.6	0.950	22	20 37 27.46	2.5050	21 56 0.7	6.624
23	18 37 8.69	2.5761	24 16 51.7	0.787	23	20 39 57.65	2.5013	21 49 19.0	6.766
24	18 39 43.29	2.5772	S.24 17 34.1	0.625	24	20 42 27.62	2.4976	S.21 42 28.8	6.906

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	20 42 27.62	2.4976	S. 21 42 28.8	6.908
1	20 44 57.36	2.4937	21 35 30.1	7.048
2	20 47 26.86	2.4897	21 28 23.0	7.187
3	20 49 56.12	2.4857	21 21 7.6	7.325
4	20 52 25.14	2.4817	21 13 44.0	7.462
5	20 54 53.92	2.4776	21 6 12.2	7.597
6	20 57 22.45	2.4734	20 58 32.3	7.732
7	20 59 50.73	2.4692	20 50 44.4	7.866
8	21 2 18.76	2.4650	20 42 48.4	7.999
9	21 4 46.53	2.4607	20 34 44.5	8.131
10	21 7 14.04	2.4563	20 26 32.7	8.261
11	21 9 41.29	2.4520	20 18 13.2	8.389
12	21 12 8.28	2.4476	20 9 46.0	8.517
13	21 14 35.00	2.4431	20 1 11.2	8.643
14	21 17 1.45	2.4387	19 52 28.8	8.769
15	21 19 27.64	2.4342	19 43 38.9	8.893
16	21 21 53.56	2.4296	19 34 41.6	9.016
17	21 24 19.20	2.4250	19 25 37.0	9.137
18	21 26 44.56	2.4204	19 16 25.1	9.257
19	21 29 9.65	2.4158	19 7 6.1	9.376
20	21 31 34.46	2.4113	18 57 40.0	9.494
21	21 33 59.00	2.4067	18 48 6.8	9.611
22	21 36 23.26	2.4020	18 38 26.7	9.725
23	21 38 47.24	2.3972	S. 18 28 39.8	9.838

MONDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	21 41 10.93	2.3925	S. 18 18 46.1	9.951
1	21 43 34.34	2.3878	18 8 45.7	10.062
2	21 45 57.47	2.3832	17 58 38.7	10.171
3	21 48 20.32	2.3785	17 48 25.2	10.279
4	21 50 42.89	2.3737	17 38 5.2	10.386
5	21 53 5.17	2.3690	17 27 38.9	10.490
6	21 55 27.17	2.3643	17 17 6.4	10.593
7	21 57 48.89	2.3596	17 6 27.7	10.696
8	22 0 10.32	2.3548	16 55 42.8	10.798
9	22 2 31.47	2.3501	16 44 51.9	10.898
10	22 4 52.34	2.3454	16 33 55.1	10.996
11	22 7 12.92	2.3407	16 22 52.4	11.093
12	22 9 33.22	2.3360	16 11 44.0	11.188
13	22 11 53.24	2.3313	16 0 29.9	11.282
14	22 14 12.98	2.3267	15 49 10.2	11.374
15	22 16 32.44	2.3221	15 37 45.0	11.465
16	22 18 51.63	2.3175	15 26 14.4	11.555
17	22 21 10.54	2.3128	15 14 38.4	11.643
18	22 23 29.17	2.3082	15 2 57.2	11.730
19	22 25 47.53	2.3037	14 51 10.8	11.815
20	22 28 5.62	2.2992	14 39 19.4	11.898
21	22 30 23.43	2.2946	14 27 23.0	11.981
22	22 32 40.97	2.2901	14 15 21.7	12.062
23	22 34 58.24	2.2857	14 3 15.6	12.142
24	22 37 15.25	2.2812	S. 13 51 4.7	12.220

TUESDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	22 37 15.25	2.2812	S. 13 51 4.7	12.220
1	22 39 31.99	2.2768	13 38 49.2	12.296
2	22 41 48.47	2.2724	13 26 29.2	12.370
3	22 44 4.68	2.2680	13 14 4.8	12.443
4	22 46 20.63	2.2637	13 1 36.0	12.516
5	22 48 36.33	2.2595	12 49 2.9	12.587
6	22 50 51.77	2.2553	12 36 25.6	12.656
7	22 53 6.96	2.2511	12 23 44.2	12.723
8	22 55 21.90	2.2469	12 10 58.8	12.789
9	22 57 36.58	2.2427	11 58 9.5	12.854
10	22 59 51.02	2.2386	11 45 16.3	12.917
11	23 2 5.21	2.2345	11 32 19.4	12.978
12	23 4 19.16	2.2305	11 19 18.9	13.038
13	23 6 32.87	2.2266	11 6 14.8	13.097
14	23 8 46.35	2.2227	10 53 7.2	13.155
15	23 10 59.59	2.2188	10 39 56.2	13.211
16	23 13 12.60	2.2149	10 26 41.9	13.265
17	23 15 25.38	2.2111	10 13 24.4	13.318
18	23 17 37.94	2.2074	10 0 3.7	13.370
19	23 19 50.27	2.2037	9 46 40.0	13.419
20	23 22 2.38	2.2001	9 33 13.4	13.467
21	23 24 14.28	2.1965	9 19 43.9	13.515
22	23 26 25.96	2.1929	9 6 11.6	13.561
23	23 28 37.43	2.1894	S. 8 52 36.6	13.604

WEDNESDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	23 30 48.69	2.1860	S. 8 38 59.1	13.646
1	23 32 59.75	2.1826	8 25 19.1	13.687
2	23 35 10.60	2.1792	8 11 36.6	13.728
3	23 37 21.25	2.1759	7 57 51.7	13.767
4	23 39 31.71	2.1727	7 44 4.6	13.803
5	23 41 41.97	2.1694	7 30 15.3	13.839
6	23 43 52.04	2.1662	7 16 23.9	13.873
7	23 46 1.92	2.1632	7 2 30.5	13.906
8	23 48 11.62	2.1602	6 48 35.2	13.937
9	23 50 21.14	2.1572	6 34 38.1	13.967
10	23 52 30.49	2.1544	6 20 39.2	13.995
11	23 54 39.67	2.1516	6 6 38.7	14.021
12	23 56 48.68	2.1488	5 52 36.7	14.046
13	23 58 57.52	2.1460	5 38 33.2	14.071
14	0 1 6.20	2.1432	5 24 28.2	14.094
15	0 3 14.71	2.1405	5 10 21.9	14.115
16	0 5 23.06	2.1379	4 56 14.4	14.135
17	0 7 31.26	2.1355	4 42 5.7	14.153
18	0 9 39.32	2.1331	4 27 56.0	14.170
19	0 11 47.23	2.1306	4 13 45.3	14.186
20	0 13 54.99	2.1282	3 59 33.7	14.201
21	0 16 2.61	2.1259	3 45 21.2	14.214
22	0 18 10.10	2.1237	3 31 8.0	14.225
23	0 20 17.46	2.1215	3 16 54.2	14.235
24	0 22 24.68	2.1193	S. 3 2 39.8	14.244

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 17.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	0 22 24.68	2.1193	S. 3 2 39.8	14.244
1	0 24 31.78	2.1173	2 48 24.9	14.252
2	0 26 38.76	2.1153	2 34 9.6	14.258
3	0 28 45.62	2.1134	2 19 54.0	14.263
4	0 30 52.37	2.1115	2 5 38.1	14.267
5	0 32 59.00	2.1096	1 51 22.0	14.268
6	0 35 5.52	2.1078	1 37 5.9	14.268
7	0 37 11.94	2.1062	1 22 49.8	14.268
8	0 39 18.26	2.1046	1 8 33.7	14.267
9	0 41 24.49	2.1030	0 54 17.7	14.264
10	0 43 30.62	2.1014	0 40 2.0	14.259
11	0 45 36.65	2.0998	0 25 46.6	14.253
12	0 47 42.59	2.0983	S. 0 11 31.6	14.246
13	0 49 48.45	2.0970	N. 0 2 42.9	14.237
14	0 51 54.23	2.0957	0 16 56.9	14.228
15	0 53 59.94	2.0945	0 31 10.3	14.217
16	0 56 5.57	2.0933	0 45 23.0	14.205
17	0 58 11.13	2.0921	0 59 34.9	14.191
18	1 0 16.62	2.0910	1 13 45.9	14.176
19	1 2 22.05	2.0900	1 27 56.0	14.160
20	1 4 27.42	2.0890	1 42 5.1	14.142
21	1 6 32.73	2.0880	1 56 13.1	14.124
22	1 8 37.98	2.0872	2 10 20.0	14.105
23	1 10 43.19	2.0864	N. 2 24 25.7	14.083

FRIDAY 18.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	1 12 48.35	2.0857	N. 2 38 30.0	14.060
1	1 14 53.47	2.0849	2 52 32.9	14.037
2	1 16 58.54	2.0842	3 6 34.4	14.012
3	1 19 3.57	2.0836	3 20 34.4	13.987
4	1 21 8.57	2.0831	3 34 32.9	13.960
5	1 23 13.54	2.0826	3 48 29.6	13.930
6	1 25 18.48	2.0822	4 2 24.5	13.900
7	1 27 23.40	2.0818	4 16 17.6	13.870
8	1 29 28.29	2.0814	4 30 8.9	13.838
9	1 31 33.16	2.0811	4 43 58.2	13.805
10	1 33 38.02	2.0808	4 57 45.5	13.771
11	1 35 42.86	2.0806	5 11 30.7	13.735
12	1 37 47.69	2.0805	5 25 13.7	13.697
13	1 39 52.52	2.0804	5 38 54.4	13.659
14	1 41 57.34	2.0803	5 52 32.8	13.621
15	1 44 2.16	2.0803	6 6 8.9	13.582
16	1 46 6.98	2.0804	6 19 42.6	13.540
17	1 48 11.81	2.0806	6 33 13.7	13.497
18	1 50 16.65	2.0807	6 46 42.2	13.453
19	1 52 21.50	2.0809	7 0 8.0	13.408
20	1 54 26.36	2.0811	7 13 31.1	13.363
21	1 56 31.23	2.0813	7 26 51.5	13.317
22	1 58 36.12	2.0817	7 40 9.1	13.268
23	2 0 41.03	2.0821	7 53 23.7	13.218
24	2 2 45.97	2.0826	N. 8 6 35.3	13.167

SATURDAY 19.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	2 2 45.97	2.0826	N. 8 6 35.3	13.167
1	2 4 50.94	2.0830	8 19 43.8	13.116
2	2 6 55.93	2.0834	8 32 49.2	13.064
3	2 9 0.95	2.0839	8 45 51.5	13.011
4	2 11 6.00	2.0845	8 58 50.5	12.956
5	2 13 11.09	2.0851	9 11 46.2	12.901
6	2 15 16.22	2.0858	9 24 38.6	12.844
7	2 17 21.39	2.0866	9 37 27.5	12.786
8	2 19 26.61	2.0873	9 50 12.9	12.727
9	2 21 31.87	2.0881	10 2 54.7	12.667
10	2 23 37.18	2.0888	10 15 32.9	12.606
11	2 25 42.53	2.0896	10 28 7.4	12.544
12	2 27 47.93	2.0905	10 40 38.2	12.482
13	2 29 53.39	2.0015	10 53 5.2	12.419
14	2 31 58.91	2.0924	11 5 28.3	12.353
15	2 34 4.48	2.0933	11 17 47.5	12.287
16	2 36 10.11	2.0944	11 30 2.7	12.219
17	2 38 15.81	2.0955	11 42 13.8	12.151
18	2 40 21.57	2.0965	11 54 20.8	12.082
19	2 42 27.39	2.0976	12 6 23.7	12.013
20	2 44 33.28	2.0987	12 18 22.4	11.942
21	2 46 39.24	2.0999	12 30 16.8	11.871
22	2 48 45.27	2.1011	12 42 6.9	11.798
23	2 50 51.37	2.1023	N.12 53 52.6	11.724

SUNDAY 20.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	2 52 57.55	2.1036	N.13 5 33.8	11.649
1	2 55 3.80	2.1048	13 17 10.5	11.574
2	2 57 10.13	2.1061	13 28 42.7	11.498
3	2 59 16.53	2.1074	13 40 10.3	11.421
4	3 1 23.01	2.1087	13 51 33.2	11.343
5	3 3 29.57	2.1101	14 2 51.4	11.264
6	3 5 36.22	2.1115	14 14 4.9	11.184
7	3 7 42.95	2.1128	14 25 13.5	11.103
8	3 9 49.76	2.1142	14 36 17.2	11.021
9	3 11 56.66	2.1156	14 47 16.0	10.939
10	3 14 3.64	2.1170	14 58 9.9	10.857
11	3 16 10.71	2.1186	15 8 58.8	10.773
12	3 18 17.87	2.1201	15 19 42.6	10.687
13	3 20 25.12	2.1216	15 30 21.2	10.601
14	3 22 32.46	2.1230	15 40 54.7	10.515
15	3 24 39.88	2.1245	15 51 23.0	10.427
16	3 26 47.40	2.1261	16 1 46.0	10.339
17	3 28 55.01	2.1276	16 12 3.7	10.250
18	3 31 2.71	2.1292	16 22 16.0	10.160
19	3 33 10.51	2.1307	16 32 22.9	10.069
20	3 35 18.40	2.1322	16 42 24.3	9.978
21	3 37 26.38	2.1338	16 52 20.3	9.886
22	3 39 34.46	2.1354	17 2 10.7	9.793
23	3 41 42.63	2.1369	17 11 55.5	9.700
24	8 43 50.89	2.1385	N.17 21 34.7	9.606

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 21.					**WEDNESDAY 23.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	3 43 50.89	2.1385	N.17 21 34.7	9.606	0	5 28 8.17	2.1987	N.23 2 39.6	4.423
1	3 45 59.25	2.1401	17 31 8.2	9.511	1	5 30 20.11	2.1993	23 7 1.5	4.306
2	3 48 7.70	2.1417	17 40 36.0	9.415	2	5 32 32.08	2.1999	23 11 16.3	4.188
3	3 50 16.25	2.1432	17 49 58.0	9.319	3	5 34 44.09	2.2004	23 15 24.0	4.069
4	3 52 24.89	2.1448	17 59 14.3	9.222	4	5 36 56.13	2.2008	23 19 24.6	3.951
5	3 54 33.63	2.1465	18 8 24.7	9.124	5	5 39 8.19	2.2012	23 23 18.1	3.833
6	3 56 42.47	2.1481	18 17 29.2	9.026	6	5 41 20.27	2.2015	23 27 4.6	3.715
7	3 58 51.40	2.1496	18 26 27.8	8.927	7	5 43 32.37	2.2018	23 30 43.9	3.596
8	4 1 0.42	2.1512	18 35 20.4	8.827	8	5 45 44.49	2.2021	23 34 16.1	3.477
9	4 3 9.54	2.1527	18 44 7.1	8.727	9	5 47 56.63	2.2024	23 37 41.2	3.358
10	4 5 18.75	2.1542	18 52 47.7	8.626	10	5 50 8.78	2.2026	23 40 59.1	3.239
11	4 7 28.05	2.1557	19 1 22.2	8.524	11	5 52 20.94	2.2027	23 44 9.9	3.121
12	4 9 37.44	2.1572	19 9 50.6	8.422	12	5 54 33.10	2.2028	23 47 13.6	3.002
13	4 11 46.92	2.1588	19 18 12.8	8.319	13	5 56 45.27	2.2028	23 50 10.1	2.883
14	4 13 56.50	2.1604	19 26 28.8	8.216	14	5 58 57.44	2.2028	23 52 59.4	2.763
15	4 16 6.17	2.1619	19 34 38.7	8.112	15	6 1 9.61	2.2028	23 55 41.6	2.643
16	4 18 15.93	2.1634	19 42 42.3	8.007	16	6 3 21.78	2.2027	23 58 16.6	2.524
17	4 20 25.78	2.1648	19 50 39.6	7.902	17	6 5 33.94	2.2026	24 0 44.5	2.405
18	4 22 35.71	2.1662	19 58 30.6	7.797	18	6 7 46.09	2.2024	24 3 5.2	2.285
19	4 24 45.73	2.1677	20 6 15.2	7.690	19	6 9 58.23	2.2022	24 5 18.7	2.165
20	4 26 55.84	2.1692	20 13 53.4	7.583	20	6 12 10.36	2.2020	24 7 25.0	2.046
21	4 29 6.03	2.1706	20 21 25.2	7.476	21	6 14 22.47	2.2017	24 9 24.2	1.927
22	4 31 16.31	2.1720	20 28 50.6	7.369	22	6 16 34.56	2.2013	24 11 16.2	1.807
23	4 33 26.67	2.1733	N.20 36 9.5	7.261	23	6 18 46.62	2.2008	N.24 13 1.0	1.687
	TUESDAY 22.					**THURSDAY 24.**			
0	4 35 37.11	2.1747	N.20 43 21.9	7.152	0	6 20 58.66	2.2004	N.24 14 38.7	1.568
1	4 37 47.63	2.1760	20 50 27.7	7.042	1	6 23 10.67	2.1999	24 16 9.2	1.448
2	4 39 58.23	2.1773	20 57 27.0	6.933	2	6 25 22.65	2.1994	24 17 32.5	1.328
3	4 42 8.91	2.1786	21 4 19.7	6.823	3	6 27 34.60	2.1988	24 18 48.6	1.209
4	4 44 19.67	2.1799	21 11 5.7	6.712	4	6 29 46.51	2.1981	24 19 57.6	1.091
5	4 46 30.50	2.1811	21 17 45.1	6.601	5	6 31 58.38	2.1974	24 20 59.5	0.972
6	4 48 41.40	2.1824	21 24 17.8	6.489	6	6 34 10.20	2.1967	24 21 54.2	0.852
7	4 50 52.38	2.1836	21 30 43.8	6.377	7	6 36 21.98	2.1959	24 22 41.8	0.733
8	4 53 3.43	2.1847	21 37 3.1	6.265	8	6 38 33.71	2.1951	24 23 22.2	0.614
9	4 55 14.54	2.1857	21 43 15.6	6.153	9	6 40 45.39	2.1942	24 23 55.5	0.496
10	4 57 25.72	2.1868	21 49 21.4	6.040	10	6 42 57.02	2.1933	24 24 21.7	0.377
11	4 59 36.96	2.1879	21 55 20.4	5.926	11	6 45 8.59	2.1923	24 24 40.8	0.258
12	5 1 48.27	2.1890	22 1 12.5	5.812	12	6 47 20.10	2.1913	24 24 52.7	0.140
13	5 3 59.64	2.1900	22 6 57.8	5.698	13	6 49 31.55	2.1902	24 24 57.6	+ 0.022
14	5 6 11.07	2.1909	22 12 36.3	5.584	14	6 51 42.93	2.1892	24 24 55.4	− 0.096
15	5 8 22.55	2.1918	22 18 7.9	5.469	15	6 53 54.25	2.1881	24 24 46.1	0.214
16	5 10 34.09	2.1928	22 23 32.6	5.354	16	6 56 5.50	2.1869	24 24 29.7	0.331
17	5 12 45.69	2.1937	22 28 50.4	5.238	17	6 58 16.68	2.1857	24 24 6.3	0.448
18	5 14 57.34	2.1946	22 34 1.2	5.123	18	7 0 27.78	2.1844	24 23 35.9	0.565
19	5 17 9.04	2.1954	22 39 5.1	5.007	19	7 2 38.80	2.1830	24 22 58.5	0.682
20	5 19 20.78	2.1961	22 44 2.0	4.890	20	7 4 49.74	2.1817	24 22 14.0	0.800
21	5 21 32.57	2.1968	22 48 51.9	4.773	21	7 7 0.61	2.1804	24 21 22.5	0.917
22	5 23 44.40	2.1975	22 53 34.8	4.657	22	7 9 11.39	2.1789	24 20 24.0	1.033
23	5 25 56.27	2.1981	22 58 10.7	4.540	23	7 11 22.08	2.1774	24 19 18.6	1.148
24	5 28 8.17	2.1987	N.23 2 39.6	4.423	24	7 13 32.68	2.1759	N.24 18 6.2	1.264

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 25.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	7 13 32.68	2.1759	N.24 18 6.2	1.264
1	7 15 43.19	2.1743	24 16 46.9	1.379
2	7 17 53.60	2.1728	24 15 20.7	1.495
3	7 20 3.92	2.1712	24 13 47.5	1.611
4	7 22 14.14	2.1694	24 12 7.4	1.725
5	7 24 24.25	2.1677	24 10 20.5	1.838
6	7 26 34.26	2.1659	24 8 26.8	1.952
7	7 28 44.16	2.1642	24 6 26.2	2.066
8	7 30 53.96	2.1624	24 4 18.8	2.180
9	7 33 3.65	2.1605	24 2 4.6	2.293
10	7 35 13.22	2.1586	23 59 43.6	2.406
11	7 37 22.68	2.1567	23 57 15.9	2.518
12	7 39 32.03	2.1548	23 54 41.5	2.630
13	7 41 41.26	2.1528	23 52 0.3	2.742
14	7 43 50.37	2.1507	23 49 12.4	2.853
15	7 45 59.35	2.1487	23 46 17.9	2.963
16	7 48 8.21	2.1467	23 43 16.8	3.074
17	7 50 16.95	2.1446	23 40 9.0	3.185
18	7 52 25.56	2.1424	23 36 54.6	3.295
19	7 54 34.04	2.1402	23 33 33.6	3.404
20	7 56 42.39	2.1381	23 30 6.1	3.513
21	7 58 50.61	2.1359	23 26 32.0	3.622
22	8 0 58.70	2.1337	23 22 51.4	3.731
23	8 3 6.66	2.1315	N.23 19 4.3	3.839

SATURDAY 26.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	8 5 14.48	2.1292	N.23 15 10.8	3.946
1	8 7 22.16	2.1269	23 11 10.8	4.053
2	8 9 29.70	2.1246	23 7 4.4	4.159
3	8 11 37.11	2.1223	23 2 51.7	4.265
4	8 13 44.38	2.1199	22 58 32.6	4.371
5	8 15 51.50	2.1174	22 54 7.1	4.477
6	8 17 58.47	2.1150	22 49 35.3	4.582
7	8 20 5.30	2.1126	22 44 57.3	4.686
8	8 22 11.99	2.1102	22 40 13.0	4.790
9	8 24 18.53	2.1077	22 35 22.5	4.893
10	8 26 24.92	2.1053	22 30 25.8	4.996
11	8 28 31.17	2.1029	22 25 22.9	5.099
12	8 30 37.27	2.1004	22 20 13.9	5.201
13	8 32 43.22	2.0979	22 14 58.8	5.302
14	8 34 49.02	2.0954	22 9 37.6	5.404
15	8 36 54.67	2.0929	22 4 10.3	5.505
16	8 39 0.17	2.0904	21 58 37.0	5.605
17	8 41 5.52	2.0879	21 52 57.7	5.704
18	8 43 10.72	2.0854	21 47 12.5	5.803
19	8 45 15.77	2.0828	21 41 21.3	5.902
20	8 47 20.66	2.0802	21 35 24.2	6.000
21	8 49 25.40	2.0777	21 29 21.3	6.098
22	8 51 29.99	2.0752	21 23 12.5	6.195
23	8 53 34.43	2.0727	21 16 57.9	6.291
24	8 55 38.72	2.0702	N.21 10 37.6	6.387

SUNDAY 27.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	8 55 38.72	2.0702	N.21 10 37.6	6.387
1	8 57 42.85	2.0676	21 4 11.5	6.482
2	8 59 46.83	2.0651	20 57 39.7	6.578
3	9 1 50.66	2.0626	20 51 2.1	6.673
4	9 3 54.34	2.0600	20 44 18.9	6.767
5	9 5 57.86	2.0574	20 37 30.1	6.860
6	9 8 1.23	2.0549	20 30 35.7	6.953
7	9 10 4.45	2.0524	20 23 35.7	7.046
8	9 12 7.52	2.0499	20 16 30.2	7.138
9	9 14 10.44	2.0474	20 9 19.2	7.229
10	9 16 13.21	2.0449	20 2 2.7	7.320
11	9 18 15.83	2.0424	19 54 40.8	7.410
12	9 20 18.30	2.0399	19 47 13.5	7.500
13	9 22 20.62	2.0375	19 39 40.8	7.589
14	9 24 22.80	2.0351	19 32 2.8	7.677
15	9 26 24.83	2.0326	19 24 19.5	7.766
16	9 28 26.71	2.0302	19 16 30.9	7.853
17	9 30 28.45	2.0277	19 8 37.1	7.940
18	9 32 30.04	2.0253	19 0 38.1	8.026
19	9 34 31.49	2.0230	18 52 33.9	8.112
20	9 36 32.80	2.0206	18 44 24.6	8.198
21	9 38 33.96	2.0182	18 36 10.1	8.284
22	9 40 34.98	2.0159	18 27 50.5	8.368
23	9 42 35.87	2.0136	N.18 19 25.9	8.451

MONDAY 28.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	9 44 36.62	2.0113	N 18 10 56.4	8.534
1	9 46 37.23	2.0091	18 2 21.9	8.617
2	9 48 37.71	2.0068	17 53 42.4	8.699
3	9 50 38.05	2.0046	17 44 58.0	8.781
4	9 52 38.26	2.0024	17 36 8.7	8.862
5	9 54 38.34	2.0003	17 27 14.6	8.942
6	9 56 38.30	1.9982	17 18 15.7	9.021
7	9 58 38.13	1.9961	17 9 12.1	9.100
8	10 0 37.83	1.9939	17 0 3.7	9.179
9	10 2 37.40	1.9918	16 50 50.6	9.257
10	10 4 36.85	1.9897	16 41 32.9	9.334
11	10 6 36.17	1.9877	16 32 10.5	9.411
12	10 8 35.37	1.9857	16 22 43.5	9.487
13	10 10 34.45	1.9838	16 13 12.0	9.562
14	10 12 33.42	1.9819	16 3 36.0	9.638
15	10 14 32.28	1.9801	15 53 55.4	9.713
16	10 16 31.03	1.9782	15 44 10.4	9.787
17	10 18 29.67	1.9764	15 34 21.0	9.860
18	10 20 28.20	1.9747	15 24 27.2	9.933
19	10 22 26.63	1.9729	15 14 29.0	10.006
20	10 24 24.95	1.9711	15 4 26.5	10.077
21	10 26 23.16	1.9694	14 54 19.8	10.147
22	10 28 21.27	1.9678	14 44 8.9	10.217
23	10 30 19.29	1.9662	14 33 53.8	10.287
24	10 32 17.21	1.9646	N.14 23 34.5	10.356

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	10 32 17.21	1.9646	N.14 23 34.5	10.356
1	10 34 15.04	1.9631	14 13 11.1	10.424
2	10 36 12.78	1.9615	14 2 43.6	10.492
3	10 38 10.42	1.9600	13 52 12.0	10.560
4	10 40 7.98	1.9586	13 41 36.4	10.627
5	10 42 5.46	1.9573	13 30 56.8	10.692
6	10 44 2.86	1.9560	13 20 13.3	10.757
7	10 46 0.18	1.9547	13 9 25.9	10.822
8	10 47 57.42	1.9534	12 58 34.6	10.887
9	10 49 54.59	1.9522	12 47 39.5	10.950
10	10 51 51.68	1.9510	12 36 40.6	11.013
11	10 53 48.71	1.9499	12 25 38.0	11.075
12	10 55 45.67	1.9488	12 14 31.6	11.137
13	10 57 42.57	1.9478	12 3 21.5	11.198
14	10 59 39.41	1.9468	11 52 7.8	11.258
15	11 1 36.18	1.9458	11 40 50.6	11.317
16	11 3 32.90	1.9449	11 29 29.8	11.377
17	11 5 29.57	1.9441	11 18 5.4	11.436
18	11 7 26.19	1.9433	11 6 37.5	11.493
19	11 9 22.76	1.9425	10 55 6.2	11.550
20	11 11 19.29	1.9418	10 43 31.5	11.607
21	11 13 15.78	1.9412	10 31 53.4	11.662
22	11 15 12.23	1.9405	10 20 12.0	11.717
23	11 17 8.64	1.9399	N.10 8 27.4	11.771

WEDNESDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	11 19 5.02	1.9394	N. 9 56 39.5	11.825
1	11 21 1.37	1.9390	9 44 48.4	11.878
2	11 22 57.70	1.9386	9 32 54.2	11.930
3	11 24 54.00	1.9382	9 20 56.8	11.982
4	11 26 50.28	1.9378	9 8 56.3	12.033
5	11 28 46.54	1.9376	8 56 52.8	12.083
6	11 30 42.79	1.9374	8 44 46.3	12.133
7	11 32 39.03	1.9372	8 32 36.8	12.182
8	11 34 35.26	1.9371	8 20 24.4	12.230
9	11 36 31.48	1.9370	8 8 9.2	12.277
10	11 38 27.70	1.9371	7 55 51.2	12.323
11	11 40 23.93	1.9372	7 43 30.4	12.369
12	11 42 20.16	1.9373	7 31 6.9	12.414
13	11 44 16.40	1.9374	7 18 40.7	12.459
14	11 46 12.65	1.9376	7 6 11.8	12.503
15	11 48 8.91	1.9378	6 53 40.3	12.546
16	11 50 5.19	1.9382	6 41 6.3	12.588
17	11 52 1.50	1.9387	6 28 29.8	12.629
18	11 53 57.83	1.9391	6 15 50.8	12.670
19	11 55 54.19	1.9396	6 3 9.4	12.710
20	11 57 50.58	1.9401	5 50 25.6	12.749
21	11 59 47.00	1.9407	5 37 39.5	12.787
22	12 1 43.46	1.9414	5 24 51.1	12.825
23	12 3 39.97	1.9422	5 12 0.5	12.862
24	12 5 36.52	1.9429	N. 4 59 7.7	12.898

THURSDAY, MAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	12 5 36.52	1.9429	N. 4 59 7.7	12.898

PHASES OF THE MOON.

		d	h	m
○ Full Moon . .	April	4	21	24.5
☾ Last Quarter		11	22	53.2
● New Moon		18	20	5.6
☽ First Quarter . . .		26	16	51.5

		d	h
☾ Perigee	April	13	5.2
☾ Apogee		26	6.0

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Aldebaran	W.	78° 42′ 22″	2975	80° 13′ 6″	2966	81° 44′ 1″	2957	83° 15′ 8″	2948
	Pollux	W.	34 39 32	3007	36 9 36	2994	37 39 56	2984	39 10 29	2972
	Spica	E.	56 11 17	3008	54 41 14	3000	53 11 2	2994	51 40 42	2985
	Antares	E.	102 3 49	2991	100 33 25	2982	99 2 51	2973	97 32 5	2964
	Mars	E.	104 0 23	3050	102 31 12	3040	101 1 48	3030	99 32 13	3020
2	Aldebaran	W.	90 53 43	2898	92 26 5	2887	93 58 40	2878	95 31 29	2867
	Pollux	W.	46 46 57	2914	48 18 58	2901	49 51 15	2890	51 23 47	2878
	Spica	E.	44 6 38	2949	42 35 22	2943	41 3 58	2936	39 32 25	2930
	Antares	E.	89 55 8	2912	88 23 5	2903	86 50 50	2893	85 18 21	2882
	Mars	E.	92 1 5	2967	90 30 11	2956	88 59 4	2945	87 27 42	2934
3	Aldebaran	W.	103 19 4	2810	104 53 18	2800	106 27 46	2788	108 2 29	2778
	Pollux	W.	59 10 15	2819	60 44 18	2807	62 18 37	2794	63 53 12	2783
	Regulus	W.	23 17 48	2859	24 50 54	2845	26 24 23	2827	27 58 15	2811
	Spica	E.	31 52 59	2911	30 20 54	2909	28 48 47	2910	27 16 41	2913
	Antares	E.	77 32 28	2826	75 58 34	2816	74 24 27	2805	72 50 6	2794
	Mars	E.	79 47 13	2875	78 14 23	2863	76 41 17	2851	75 7 55	2839
4	Pollux	W.	71 49 58	2724	73 26 6	2712	75 2 29	2700	76 39 8	2690
	Saturn	W.	36 29 32	2708	38 6 1	2695	39 42 46	2682	41 19 47	2670
	Regulus	W.	35 52 38	2738	37 28 27	2724	39 4 33	2711	40 40 57	2698
	Antares	E.	64 54 44	2740	63 18 57	2730	61 42 56	2720	60 6 42	2710
	Mars	E.	67 17 15	2779	65 42 20	2767	64 7 10	2757	62 31 44	2745
5	Pollux	W.	84 46 5	2634	86 24 13	2624	88 2 35	2613	89 41 12	2603
	Saturn	W.	49 28 45	2616	51 7 18	2605	52 46 6	2594	54 25 8	2584
	Regulus	W.	48 47 6	2639	50 25 8	2627	52 3 25	2616	53 41 57	2605
	Antares	E.	52 2 15	2662	50 24 44	2653	48 47 2	2645	47 9 9	2637
	Mars	E.	54 30 45	2686	52 53 47	2675	51 16 36	2664	49 39 9	2653
	α Aquilæ	E.	99 9 9	3356	97 46 2	3341	96 22 37	3325	94 58 55	2311
6	Pollux	W.	97 57 39	2554	99 37 37	2545	101 17 47	2537	102 58 9	2527
	Saturn	W.	62 43 51	2534	64 24 16	2525	66 4 54	2516	67 45 44	2507
	Regulus	W.	61 58 17	2554	63 38 15	2544	65 18 26	2534	66 58 50	2525
	Antares	E.	38 57 15	2606	37 18 29	2602	35 39 37	2598	34 0 40	2597
	Mars	E.	41 28 22	2603	39 49 31	2593	38 10 26	2583	36 31 9	2574
	α Aquilæ	E.	87 56 49	3260	86 31 51	3254	85 6 45	3249	83 41 32	3244
	Jupiter	E.	97 35 38	2595	95 56 36	2586	94 17 22	2575	92 37 55	2566
7	Saturn	W.	76 13 1	2466	77 55 2	2458	79 37 15	2450	81 19 38	2442
	Regulus	W.	75 23 58	2483	77 5 35	2475	78 47 23	2467	80 29 21	2460
	Mars	E.	28 11 35	2531	26 31 5	2523	24 50 23	2515	23 9 31	2507
	α Aquilæ	E.	76 34 51	3245	75 9 35	3250	73 44 23	3256	72 19 20	3264
	Jupiter	E.	84 17 38	2525	82 37 0	2517	80 56 11	2509	79 15 11	2503
8	Saturn	W.	89 54 6	2409	91 37 27	2403	93 20 57	2397	95 4 36	2391
	Regulus	W.	89 1 48	2426	90 44 45	2420	92 27 52	2414	94 11 7	2408
	Spica	W.	35 18 59	2499	37 0 14	2486	38 41 47	2474	40 23 36	2464
	α Aquilæ	E.	65 17 9	3334	63 53 37	3356	62 30 31	3381	61 7 53	3411
	Jupiter	E.	70 47 42	2468	69 5 44	2462	67 23 37	2456	65 41 22	2450
	Fomalhaut	E.	95 29 50	2598	93 50 53	2592	92 11 47	2585	90 32 32	2579

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Aldebaran	W.	84° 46′ 26″	2938	86° 17′ 56″	2928	87° 49′ 39″	2919	89° 21′ 35″	2908
	Pollux	W.	40 41 17	2960	42 12 20	2949	43 43 37	2936	45 15 10	2925
	Spica	E.	50 10 11	2979	48 39 32	2971	47 8 43	2964	45 37 45	2957
	Antares	E.	96 1 6	2954	94 29 56	2944	92 58 32	2934	91 26 56	2923
	Mars	E.	98 2 25	3010	96 32 25	3000	95 2 11	2989	93 31 45	2978
2	Aldebaran	W.	97 4 32	2856	98 37 48	2844	100 11 19	2833	101 45 4	2821
	Pollux	W.	52 56 34	2867	54 29 36	2854	56 2 54	2842	57 36 27	2830
	Spica	E.	38 0 44	2924	36 28 56	2919	34 57 2	2915	33 25 2	2912
	Antares	E.	83 45 38	2871	82 12 42	2861	80 39 31	2850	79 6 6	2838
	Mars	E.	85 56 6	2922	84 24 15	2911	82 52 9	2899	81 19 49	2887
3	Aldebaran	W.	109 37 26	2765	111 12 39	2755	112 48 6	2743	114 23 48	2733
	Pollux	W.	65 28 2	2771	67 3 8	2759	68 38 29	2747	70 14 6	2736
	Regulus	W.	29 32 28	2795	31 7 2	2781	32 41 55	2765	34 17 8	2752
	Spica	E.	25 44 41	2923	24 12 50	2932	22 41 12	2946	21 9 52	2965
	Antares	E.	71 15 30	2782	69 40 39	2772	68 5 35	2762	66 30 16	2751
	Mars	E.	73 34 18	2827	72 0 26	2815	70 26 18	2803	68 51 54	2791
4	Pollux	W.	78 16 1	2678	79 53 10	2667	81 30 34	2657	83 8 12	2645
	Saturn	W.	42 57 4	2660	44 34 37	2649	46 12 24	2638	47 50 27	2627
	Regulus	W.	42 17 38	2686	43 54 36	2674	45 31 50	2662	47 9 20	2650
	Antares	E.	58 30 15	2699	56 53 34	2689	55 16 40	2681	53 39 34	2671
	Mars	E.	60 56 3	2732	59 20 6	2720	57 43 54	2709	56 7 27	2698
5	Pollux	W.	91 20 2	2593	92 59 6	2583	94 38 24	2574	96 17 55	2564
	Saturn	W.	56 4 25	2574	57 43 56	2564	59 23 40	2554	61 3 39	2544
	Regulus	W.	55 20 44	2595	56 59 46	2584	58 39 2	2574	60 18 33	2564
	Antares	E.	45 31 5	2629	43 52 50	2624	42 14 27	2617	40 35 55	2611
	Mars	E.	48 1 28	2643	46 23 32	2633	44 45 23	2623	43 6 59	2613
	α Aquilæ	E.	93 34 56	3299	92 10 43	3268	90 46 16	3277	89 21 38	3268
6	Pollux	W.	104 38 44	2519	106 19 30	2511	108 0 28	2503	109 41 37	2495
	Saturn	W.	69 26 48	2498	71 8 4	2490	72 49 31	2482	74 31 10	2474
	Regulus	W.	68 39 27	2516	70 20 17	2507	72 1 18	2499	73 42 32	2491
	Antares	E.	32 21 41	2597	30 42 43	2598	29 3 45	2600	27 24 49	2605
	Mars	E.	34 51 39	2565	33 11 56	2556	31 32 1	2547	29 51 54	2539
	α Aquilæ	E.	82 16 15	3241	80 50 55	3240	79 25 33	3240	78 0 11	3241
	Jupiter	E.	90 58 16	2557	89 18 24	2550	87 38 21	2541	85 58 5	2533
7	Saturn	W.	83 2 12	2435	84 44 56	2428	86 27 50	2421	88 10 53	2414
	Regulus	W.	82 11 31	2453	83 53 50	2445	85 36 20	2438	87 18 59	2432
	Mars	E.	21 28 28	2500	19 47 15	2493	18 5 52	2486	16 24 20	2479
	α Aquilæ	E.	70 54 25	3274	69 29 43	3285	68 5 14	3299	66 41 2	3316
	Jupiter	E.	77 34 1	2497	75 52 40	2490	74 11 10	2482	72 29 30	2475
8	Saturn	W.	96 48 23	2386	98 32 18	2380	100 16 21	2375	102 0 31	2370
	Regulus	W.	95 54 30	2402	97 38 2	2396	99 21 41	2391	101 5 27	2386
	Spica	W.	42 5 39	2453	43 47 57	2444	45 30 29	2436	47 13 12	2428
	α Aquilæ	E.	59 45 45	3442	58 24 12	3474	57 3 19	3513	55 43 9	3559
	Jupiter	E.	63 58 58	2444	62 16 26	2439	60 33 47	2434	58 51 1	2429
	Fomalhaut	E.	88 53 8	2574	87 13 37	2568	85 33 59	2564	83 54 15	2560

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
9	Saturn	W.	103° 44′ 49″	2365	105° 29′ 14″	2360	107° 13′ 45″	2355	108° 58′ 22″	2351
	Regulus	W.	102 49 21	2381	104 33 22	2376	106 17 30	2371	108 1 44	2367
	Spica	W.	48 56 7	2420	50 39 13	2412	52 22 30	2405	54 5 56	2399
	Jupiter	E.	57 8 7	2424	55 25 7	2419	53 42 0	2414	51 58 47	2410
	Fomalhaut	E.	82 14 25	2557	80 34 31	2553	78 54 32	2552	77 14 31	2548
	Sun	E.	128 25 48	2713	126 49 25	2706	125 12 53	2700	123 36 13	2694
10	Spica	W.	62 45 17	2372	64 29 32	2367	66 13 54	2362	67 58 23	2359
	Jupiter	E.	43 21 16	2393	41 37 32	2390	39 53 43	2387	38 9 50	2385
	Fomalhaut	E.	68 53 56	2550	67 13 51	2553	65 33 48	2556	63 53 48	2558
	α Pegasi	E.	87 3 5	2746	85 27 27	2744	83 51 46	2744	82 16 5	2744
	Sun	E.	115 31 7	2669	113 53 45	2665	112 16 18	2660	110 38 45	2656
11	Spica	W.	76 42 11	2340	78 27 13	2337	80 12 18	2334	81 57 28	2331
	Antares	W.	30 57 36	2400	32 41 11	2388	34 25 3	2379	36 9 7	2370
	Mars	W.	26 41 35	2354	28 26 16	2350	30 11 1	2347	31 55 52	2344
	Jupiter	E.	29 29 49	2380	27 45 46	2381	26 1 43	2383	24 17 40	2385
	Fomalhaut	E.	55 35 24	2587	53 56 11	2598	52 17 14	2609	50 38 32	2623
	α Pegasi	E.	74 18 5	2759	72 42 43	2765	71 7 29	2771	69 32 24	2780
	Sun	E.	102 29 40	2639	100 51 37	2635	99 13 30	2632	97 35 18	2629
12	Spica	W.	90 44 13	2320	92 29 43	2318	94 15 15	2316	96 0 50	2315
	Antares	W.	44 52 12	2339	46 37 14	2334	48 22 22	2330	50 7 37	2326
	Mars	W.	40 41 5	2332	42 26 18	2329	44 11 35	2327	45 56 55	2325
	α Pegasi	E.	61 40 21	2844	60 6 51	2863	58 33 45	2883	57 1 5	2906
	Sun	E.	89 23 25	2617	87 44 53	2615	86 6 19	2613	84 27 42	2611
13	Spica	W.	104 49 7	2312	106 34 49	2312	108 20 31	2312	110 6 13	2313
	Antares	W.	58 55 0	2314	60 40 39	2312	62 26 21	2310	64 12 6	2309
	Mars	W.	54 44 15	2317	56 29 49	2316	58 15 26	2315	60 1 3	2314
	α Pegasi	E.	49 26 15	3068	47 57 27	3113	46 29 34	3163	45 2 41	3220
	Sun	E.	76 14 7	2606	74 35 20	2605	72 56 33	2605	71 17 45	2604
14	Antares	W.	73 1 7	2307	74 46 56	2308	76 32 45	2308	78 18 33	2309
	Mars	W.	68 49 21	2313	70 35 1	2314	72 20 41	2315	74 6 19	2316
	Sun	E.	63 3 45	2607	61 25 0	2608	59 46 17	2610	58 7 36	2612
15	Antares	W.	87 7 6	2317	88 52 41	2320	90 38 11	2323	92 23 37	2326
	Mars	W.	82 54 8	2322	84 39 35	2324	86 24 58	2326	88 10 18	2329
	α Aquilæ	W.	48 10 16	3795	49 25 23	3716	50 41 53	3645	51 59 38	3582
	Sun	E.	49 54 56	2626	48 16 37	2630	46 38 23	2634	45 0 14	2639
16	Antares	W.	101 9 26	2347	102 54 17	2352	104 39 0	2358	106 23 34	2364
	α Aquilæ	W.	58 42 56	3361	60 5 54	3331	61 29 29	3303	62 53 37	3277
	Sun	E.	36 51 22	2671	35 14 3	2678	33 36 53	2688	31 59 57	2697
20	Sun	W.	14 43 53	3127	16 11 30	3113	17 39 25	3107	19 7 27	3105
	Pollux	E.	67 36 48	2635	65 58 41	2648	64 20 52	2662	62 43 21	2675
	Saturn	E.	102 26 47	2621	100 48 21	2635	99 10 12	2648	97 32 21	2661
	Regulus	E.	103 36 4	2632	101 57 53	2644	100 19 58	2657	98 42 21	2670
21	Sun	W.	26 27 24	3125	27 55 3	3134	29 22 31	3145	30 49 47	3154

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^{h}.	P. L. of Diff.	XVIII^{h}.	P. L. of Diff.	XXI^{h}.	P. L. of Diff.
9	SATURN	W.	110° 43′ 7″	2347	112° 27′ 57″	2343	114° 12′ 53″	2339	115° 57′ 54″	2336
	Regulus	W.	109 46 4	2364	111 30 30	2360	113 15 2	2356	114 59 39	2352
	Spica	W.	55 49 32	2393	57 33 16	2388	59 17 8	2381	61 1 9	2377
	JUPITER	E.	50 15 27	2407	48 32 2	2403	46 48 32	2399	45 4 57	2396
	Fomalhaut	E.	75 34 25	2548	73 14 19	2547	72 14 11	2547	70 34 3	2547
	SUN	E.	121 59 26	2689	120 22 32	2683	118 45 30	2679	117 8 22	2674
10	Spica	W.	69 42 57	2354	71 27 38	2350	73 12 24	2347	74 57 15	2344
	JUPITER	E.	36 25 55	2383	34 41 56	2381	32 57 56	2380	31 13 53	2380
	Fomalhaut	E.	62 13 52	2561	60 34 3	2565	58 54 20	2572	57 14 47	2579
	α Pegasi	E.	80 40 24	2743	79 4 44	2747	77 29 7	2749	75 53 33	2754
	SUN	E.	109 1 6	2652	107 23 22	2648	105 45 33	2645	104 7 39	2642
11	Spica	W.	83 42 42	2328	85 28 0	2326	87 13 21	2324	88 58 45	2322
	Antares	W.	37 53 24	2363	39 37 52	2356	41 22 30	2350	43 7 17	2344
	MARS	W.	33 40 46	2341	35 25 45	2338	37 10 48	2336	38 55 54	2334
	JUPITER	E.	22 33 41	2388	20 49 49	2394	19 6 6	2403	17 22 36	2409
	Fomalhaut	E.	49 0 9	2638	47 22 6	2655	45 44 26	2676	44 7 14	2699
	α Pegasi	E.	67 57 30	2790	66 22 49	2800	64 48 22	2814	63 14 12	2828
	SUN	E.	95 57 2	2626	94 18 43	2623	92 40 20	2621	91 1 54	2619
12	Spica	W.	97 46 27	2314	99 32 5	2313	101 17 45	2312	103 3 26	2312
	Antares	W.	51 52 56	2323	53 38 21	2320	55 23 50	2318	57 9 23	2316
	MARS	W.	47 42 18	2323	49 27 44	2321	51 13 12	2319	52 58 43	2318
	α Pegasi	E.	55 28 54	2932	53 57 16	2960	52 26 14	2992	50 55 52	3029
	SUN	E.	82 49 2	2610	81 10 21	2609	79 31 38	2608	77 52 53	2607
13	Spica	W.	111 51 55	2313	113 37 35	2314	115 23 14	2315	117 8 52	2317
	Antares	W.	65 57 52	2308	67 43 40	2307	69 29 28	2307	71 15 17	2307
	MARS	W.	61 46 41	2313	63 32 21	2313	65 18 1	2313	67 3 41	2314
	α Pegasi	E.	43 36 56	3284	42 12 26	3355	40 49 18	3436	39 27 43	3528
	SUN	E.	69 38 56	2604	68 0 7	2604	66 21 19	2605	64 42 32	2606
14	Antares	W.	80 4 20	2310	81 50 5	2311	83 35 48	2313	85 21 29	2315
	MARS	W.	75 51 57	2317	77 37 32	2318	79 23 7	2319	81 8 39	2320
	SUN	E.	56 28 57	2614	54 50 21	2617	53 11 49	2620	51 33 21	2623
15	Antares	W.	94 8 58	2329	95 54 15	2333	97 39 25	2337	99 24 29	2341
	MARS	W.	89 55 33	2333	91 40 44	2336	93 25 50	2340	95 10 51	2344
	α Aquilæ	W.	53 18 32	3535	54 38 18	3482	55 59 2	3436	57 20 37	3396
	SUN	E.	43 22 12	2644	41 44 17	2651	40 6 30	2656	38 28 51	2663
16	Antares	W.	108 8 0	2370	109 52 18	2377	111 36 25	2384	113 20 22	2393
	αAquilæ	W.	64 18 13	3259	65 43 14	3239	67 8 37	3223	68 34 19	3207
	SUN	E.	30 23 14	2708	28 46 45	2719	27 10 31	2733	25 34 35	2747
20	SUN	W.	20 35 33	3104	22 3 39	3105	23 31 42	3111	24 59 38	3119
	Pollux	E.	61 6 8	2689	59 29 13	2703	57 52 37	2715	56 16 18	2730
	SATURN	E.	95 54 47	2673	94 17 30	2686	92 40 31	2699	91 3 50	2712
	Regulus	E.	97 5 2	2683	95 27 59	2696	93 51 15	2709	92 14 47	2722
21	SUN	W.	32 16 51	3165	33 43 43	3175	35 10 22	3187	36 36 47	3198

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
21	Pollux	E.	54 40 18	2744	53 4 37	2758	51 29 14	2771	49 54 9	2785
	Saturn	E.	89 27 27	2725	87 51 21	2739	86 15 32	2752	84 40 1	2765
	Regulus	E.	90 38 37	2736	89 2 45	2749	87 27 10	2762	85 51 52	2775
22	Sun	W.	38 2 59	3209	39 28 57	3221	40 54 41	3232	42 20 12	3243
	Pollux	E.	42 3 19	2855	40 30 3	2870	38 57 6	2885	37 24 28	2899
	Saturn	E.	76 46 41	2829	75 12 51	2841	73 39 17	2853	72 5 58	2865
	Regulus	E.	77 59 36	2839	76 25 59	2852	74 52 38	2864	73 19 32	2876
23	Sun	W.	49 24 27	3300	50 48 40	3310	52 12 40	3320	53 36 28	3330
	Saturn	E.	64 23 15	2922	62 51 25	2933	61 19 49	2944	59 48 27	2954
	Regulus	E.	65 37 53	2933	64 6 16	2944	62 34 54	2955	61 3 44	2966
	Spica	E.	119 36 31	2958	118 5 25	2967	116 34 31	2976	115 3 48	2985
24	Sun	W.	60 32 44	3375	61 55 29	3383	63 18 4	3391	64 40 31	3398
	Aldebaran	W.	27 15 2	3042	28 44 22	3046	30 13 38	3050	31 42 49	3054
	Saturn	E.	52 14 38	3000	50 44 26	3008	49 14 25	3016	47 44 33	3024
	Regulus	E.	53 31 5	3012	52 1 8	3021	50 31 21	3029	49 1 45	3037
	Spica	E.	107 32 57	3026	106 3 17	3034	104 33 46	3041	103 4 23	3048
25	Sun	W.	71 30 51	3428	72 52 36	3432	74 14 16	3436	75 35 52	3440
	Aldebaran	W.	39 7 36	3071	40 36 21	3074	42 5 2	3077	43 33 40	3079
	Saturn	E.	40 17 26	3057	38 48 24	3062	37 19 29	3065	35 50 39	3070
	Regulus	E.	41 36 2	3072	40 7 18	3078	38 38 42	3083	37 10 13	3089
	Spica	E.	95 39 25	3075	94 10 45	3080	92 42 10	3084	91 13 40	3087
26	Sun	W.	82 22 59	3451	83 44 18	3451	85 5 37	3451	86 26 56	3451
	Aldebaran	W.	50 56 18	3088	52 24 45	3087	53 53 13	3084	55 21 42	3083
	Saturn	E.	28 27 53	3092	26 59 34	3096	25 31 18	3100	24 3 7	3103
	Regulus	E.	29 49 28	3117	28 21 39	3121	26 53 56	3125	25 26 20	3132
	Spica	E.	83 52 2	3098	82 23 50	3098	80 55 38	3099	79 27 26	3099
27	Sun	W.	93 13 50	3440	94 35 21	3436	95 56 56	3432	97 18 36	3428
	Aldebaran	W.	62 44 31	3072	64 13 14	3068	65 42 2	3064	67 10 54	3060
	Spica	E.	72 6 20	3092	70 38 1	3090	69 9 38	3087	67 41 12	3083
28	Sun	W.	104 8 24	3398	105 30 43	3390	106 53 12	3382	108 15 49	3373
	Aldebaran	W.	74 36 49	3031	76 6 23	3025	77 36 5	3017	79 5 57	3008
	Pollux	W.	30 33 23	3067	32 2 13	3056	33 31 16	3046	35 0 32	3035
	Spica	E.	60 17 47	3059	58 48 48	3053	57 19 41	3047	55 50 28	3041
29	Sun	W.	115 11 31	3324	116 35 14	3313	117 59 10	3302	119 23 19	3290
	Aldebaran	W.	86 37 54	2963	88 8 53	2953	89 40 5	2942	91 11 30	2932
	Pollux	W.	42 30 15	2980	44 0 53	2968	45 31 46	2956	47 2 54	2943
	Spica	E.	48 22 17	3006	46 52 12	2999	45 21 58	2991	43 51 34	2984
	Antares	E.	94 12 9	2977	92 41 28	2967	91 10 33	2957	89 39 25	2946
30	Aldebaran	W.	98 52 9	2872	100 25 3	2860	101 58 13	2847	103 31 39	2834
	Pollux	W.	54 42 29	2880	56 15 13	2866	57 48 15	2853	59 21 34	2840
	Spica	E.	36 17 17	2949	34 46 0	2944	33 14 37	2938	31 43 7	2934
	Antares	E.	82 0 11	2886	80 27 35	2873	78 54 43	2859	77 21 35	2847
	Mars	E.	86 15 41	2833	84 41 56	2820	83 7 55	2807	81 33 36	2793

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
21	Pollux	E.	48° 19′ 22″	2800	46° 44′ 54″	2814	45° 10′ 44″	2828	43° 36′ 52″	2842
	SATURN	E.	83 4 47	2778	81 29 51	2791	79 55 10	2804	78 20 47	2817
	Regulus	E.	84 16 51	2787	82 42 7	2800	81 7 40	2813	79 33 30	2826
22	SUN	W.	43 45 30	3255	45 10 34	3267	46 35 24	3277	48 0 2	3288
	Pollux	E.	35 52 8	2912	34 20 5	2928	32 48 22	2942	31 16 57	2958
	SATURN	E.	70 32 56	2877	69 0 8	2889	67 27 36	2900	65 55 18	2911
	Regulus	E.	71 46 42	2888	70 14 8	2900	68 41 48	2911	67 9 43	2922
23	SUN	W.	55 0 5	3339	56 23 31	3348	57 46 45	3357	59 9 50	3366
	SATURN	E.	58 17 17	2964	56 46 20	2973	55 15 34	2982	53 45 1	2991
	Regulus	E.	59 32 48	2976	58 2 5	2985	56 31 33	2994	55 1 13	3003
	Spica	E.	113 33 17	2993	112 2 56	3002	110 32 46	3010	109 2 47	3018
24	SUN	W.	66 2 49	3405	67 25 0	3411	68 47 4	3417	70 9 1	3423
	Aldebaran	W.	33 11 55	3058	34 40 57	3062	36 9 55	3065	37 38 48	3068
	SATURN	E.	46 14 51	3032	44 45 18	3039	43 15 52	3045	41 46 35	3051
	Regulus	E.	47 32 18	3045	46 3 1	3052	44 33 52	3058	43 4 53	3065
	Spica	E.	101 35 9	3054	100 6 3	3060	98 37 4	3065	97 8 11	3070
25	SUN	W.	76 57 23	3443	78 18 51	3445	79 40 16	3447	81 1 38	3449
	Aldebaran	W.	45 2 16	3081	46 30 49	3083	47 59 20	3085	49 27 49	3086
	SATURN	E.	34 21 56	3077	32 53 18	3082	31 24 45	3086	29 56 17	3090
	Regulus	E.	35 41 51	3095	34 13 36	3101	32 45 27	3107	31 17 25	3112
	Spica	E.	89 45 14	3090	88 16 52	3093	86 48 33	3095	85 20 16	3097
26	SUN	W.	87 48 15	3451	89 9 36	3449	90 30 58	3447	91 52 23	3444
	Aldebaran	W.	56 50 11	3082	58 18 43	3080	59 47 16	3078	61 15 52	3075
	SATURN	E.	22 35 1	3106	21 6 59	3110	19 39 2	3116	18 11 12	3123
	Regulus	E.	23 58 52	3141	22 31 35	3151	21 4 28	3162	19 37 34	3176
	Spica	E.	77 59 16	3098	76 31 4	3097	75 2 51	3096	73 34 36	3095
27	SUN	W.	98 40 21	3423	100 2 11	3416	101 24 9	3412	102 46 12	3405
	Aldebaran	W.	68 39 52	3055	70 8 56	3050	71 38 6	3044	73 7 24	3038
	Spica	E.	66 12 41	3079	64 44 6	3075	63 15 25	3070	61 46 39	3065
28	SUN	W.	109 38 36	3364	111 1 33	3355	112 24 41	3345	113 48 0	3335
	Aldebaran	W.	80 35 59	3000	82 6 11	2992	83 36 34	2983	85 7 8	2973
	Pollux	W.	36 30 1	3024	37 59 44	3012	39 29 41	3002	40 59 51	2991
	Spica	E.	54 21 7	3034	52 51 37	3028	51 21 59	3021	49 52 12	3014
29	SUN	W.	120 47 42	3279	122 12 18	3266	123 37 9	3253	125 2 15	3240
	Aldebaran	W.	92 43 8	2920	94 15 1	2908	95 47 9	2897	97 19 31	2885
	Pollux	W.	48 34 18	2932	50 5 56	2919	51 37 51	2906	53 10 2	2893
	Spica	E.	42 21 1	2976	40 50 19	2968	39 19 27	2961	37 48 26	2955
	Antares	E.	88 8 4	2934	86 36 28	2923	85 4 37	2911	83 32 32	2899
30	Aldebaran	W.	105 5 23	2821	106 39 23	2807	108 13 41	2794	109 48 17	2781
	Pollux	W.	60 55 10	2825	62 29 5	2812	64 3 17	2797	65 37 49	2784
	Spica	E.	30 11 31	2933	28 39 55	2933	27 8 17	2931	25 36 39	2930
	Antares	E.	75 48 10	2835	74 14 28	2821	72 40 28	2809	71 6 12	2795
	MARS	E.	79 58 59	2778	78 24 3	2766	76 48 51	2732	75 13 20	2737

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Thur.	1	2 34 25.58	9.542	N.15 8 52.0	+45.21	15 54.21	66.08	3 1.63	0.313
Frid.	2	2 38 14.87	9.565	15 26 49.6	44.58	15 53.98	66.16	3 8.87	0.290
Sat.	3	2 42 4.70	9.588	15 44 31.8	43.94	15 53.75	66.24	3 15.58	0.267
SUN.	4	2 45 55.08	9.611	16 1 58.3	+43.28	15 53.52	66.32	3 21.74	0.244
Mon.	5	2 49 46.02	9.634	16 19 9.0	42.61	15 53.29	66.40	3 27.33	0.221
Tues.	6	2 53 37.53	9.658	16 36 3.4	41.93	15 53.07	66.48	3 32.36	0.197
Wed.	7	2 57 29.61	9.683	16 52 41.4	+41.23	15 52.84	66.56	3 36.83	0.173
Thur.	8	3 1 22.27	9.707	17 9 2.6	40.53	15 52.62	66.64	3 40.72	0.149
Frid.	9	3 5 15.53	9.731	17 25 6.8	39.81	15 52.40	66.72	3 44.00	0.125
Sat.	10	3 9 9.38	9.756	17 40 53.7	+39.08	15 52.18	66.80	3 46.70	0.100
SUN.	11	3 13 3.82	9.781	17 56 22.9	38.34	15 51.96	66.88	3 48.81	0.075
Mon.	12	3 16 58.85	9.806	18 11 34.3	37.59	15 51.75	66.97	3 50.33	0.050
Tues.	13	3 20 54.48	9.831	18 26 27.4	+36.83	15 51.54	67.05	3 51.26	0.025
Wed.	14	3 24 50.70	9.855	18 41 2.0	36.05	15 51.33	67.13	3 51.59	0.001
Thur.	15	3 28 47.52	9.880	18 55 17.8	35.26	15 51.13	67.21	3 51.32	0.024
Frid.	16	3 32 44.92	9.904	19 9 14.6	+34.46	15 50.93	67.29	3 50.48	0.048
Sat.	17	3 36 42.90	9.928	19 22 52.1	33.64	15 50.74	67.37	3 49.07	0.072
SUN.	18	3 40 41.44	9.951	19 36 9.8	32.82	15 50.55	67.45	3 47.09	0.095
Mon.	19	3 44 40.54	9.974	19 49 7.6	+31.99	15 50.36	67.53	3 44.55	0.118
Tues.	20	3 48 40.19	9.996	20 1 45.2	31.14	15 50.18	67.61	3 41.46	0.140
Wed.	21	3 52 40.38	10.018	20 14 2.2	30.27	15 50.00	67.69	3 37.84	0.162
Thur.	22	3 56 41.10	10.041	20 25 58.5	+29.40	15 49.83	67.76	3 33.69	0.184
Frid.	23	4 0 42.33	10.062	20 37 33.8	28.52	15 49.66	67.84	3 29.03	0.205
Sat.	24	4 4 44.07	10.083	20 48 47.8	27.63	15 49.50	67.91	3 23.86	0.226
SUN.	25	4 8 46.30	10.103	20 59 40.3	+26.73	15 49.34	67.98	3 18.20	0.246
Mon.	26	4 12 49.01	10.123	21 10 11.1	25.82	15 49.18	68.05	3 12.07	0.266
Tues.	27	4 16 52.19	10.142	21 20 19.9	24.90	15 49.03	68.12	3 5.47	0.285
Wed.	28	4 20 55.82	10.161	21 30 6.6	+23.97	15 48.89	68.18	2 58.41	0.304
Thur.	29	4 24 59.89	10.179	21 39 30.9	23.03	15 48.75	68.25	2 50.92	0.322
Frid.	30	4 29 4.39	10.196	21 48 32.6	22.09	15 48.61	68.31	2 43.00	0.339
Sat.	31	4 33 9.30	10.213	21 57 11.5	21.14	15 48.47	68.37	2 34.67	0.356
SUN.	32	4 37 14.62	10.230	N.22 5 27.6	+20.19	15 48.34	68.43	2 25.93	0.373

Note.—The mean time of semidiameter passing may be found by subtracting $0^s.18$ from the sidereal time.

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Thur.	1	2 34 26.06	9.543	N. 15 8 54.2	+45.21	3 1.65	0.313	2 37 27.70
Frid.	2	2 38 15.37	9.566	15 26 51.8	44.58	3 8.89	0.290	2 41 24.26
Sat.	3	2 42 5.22	9.589	15 44 34.1	43.94	3 15.59	0.267	2 45 20.81
SUN.	4	2 45 55.62	9.612	16 2 0.7	+43.28	3 21.75	0.244	2 49 17.37
Mon.	5	2 49 46.58	9.635	16 19 11.4	42.61	3 27.34	0.221	2 53 13.92
Tues.	6	2 53 38.11	9.659	16 36 5.9	41.93	3 32.37	0.197	2 57 10.48
Wed.	7	2 57 30.20	9.683	16 52 43.9	+41.23	3 36.84	0.173	3 1 7.04
Thur.	8	3 1 22.87	9.707	17 9 5.2	40.53	3 40.73	0.149	3 5 3.60
Frid.	9	3 5 16.14	9.731	17 25 9.4	39.81	3 44.01	0.125	3 9 0.15
Sat.	10	3 9 10.00	9.756	17 40 56.2	+39.08	3 46.71	0.100	3 12 56.71
SUN.	11	3 13 4.44	9.781	17 56 25.4	38.34	3 48.82	0.075	3 16 53.26
Mon.	12	3 16 59.48	9.806	18 11 36.7	37.59	3 50.34	0.050	3 20 49.82
Tues.	13	3 20 55.12	9.831	18 26 29.8	+36.83	3 51.26	0.025	3 24 46.37
Wed.	14	3 24 51.34	9.855	18 41 4.3	36.05	3 51.59	0.001	3 28 42.93
Thur.	15	3 28 48.16	9.880	18 55 20.1	35.26	3 51.32	0.024	3 32 39.48
Frid.	16	3 32 45.56	9.904	19 9 16.8	+34.46	3 50.48	0.048	3 36 36.04
Sat.	17	3 36 43.53	9.928	19 22 54.2	33.64	3 49.07	0.072	3 40 32.60
SUN.	18	3 40 42.07	9.951	19 36 11.9	32.82	3 47.09	0.095	3 44 29.16
Mon.	19	3 44 41.17	9.974	19 49 9.6	+31.99	3 44.55	0.118	3 48 25.71
Tues.	20	3 48 40.81	9.996	20 1 47.1	31.14	3 41.46	0.140	3 52 22.27
Wed.	21	3 52 40.99	10.018	20 14 4.1	30.27	3 37.83	0.162	3 56 18.82
Thur.	22	3 56 41.70	10.040	20 26 0.3	+29.40	3 33.68	0.184	4 0 15.38
Frid.	23	4 0 42.92	10.061	20 37 35.5	28.52	3 29.02	0.205	4 4 11.94
Sat.	24	4 4 44.65	10.082	20 48 49.4	27.63	3 23.85	0.226	4 8 8.50
SUN.	25	4 8 46.86	10.102	20 59 41.8	+26.73	3 18.19	0.246	4 12 5.05
Mon.	26	4 12 49.55	10.122	21 10 12.5	25.82	3 12.06	0.266	4 16 1.61
Tues.	27	4 16 52.70	10.141	21 20 21.2	24.90	3 5.46	0.285	4 19 58.16
Wed.	28	4 20 56.32	10.160	21 30 7.8	+23.97	2 58.40	0.304	4 23 54.72
Thur.	29	4 25 0.37	10.178	21 39 32.0	23.03	2 50.91	0.322	4 27 51.28
Frid.	30	4 29 4.85	10.195	21 48 33.6	22.09	2 42.99	0.339	4 31 47.84
Sat.	31	4 33 9.74	10.212	21 57 12.4	21.14	2 34.66	0.356	4 35 44.40
SUN.	32	4 37 15.04	10.229	N. 22 5 28.4	+20.19	2 25.92	0.373	4 39 40.96

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

Diff. for 1 Hour
$+9^{s}.8565$.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	λ′	Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	121	41 2 37.1	2 39.0	145.39	+ 0.76	0.0035306	+44.1	21 19 2.18
2	122	42 0 45.5	0 47.3	145.31	0.72	0.0036361	43.8	21 15 6.27
3	123	42 58 52.1	58 53.7	145.24	0.66	0.0037410	43.6	21 11 10.36
4	124	43 56 56.9	56 58.4	145.17	+ 0.57	0.0038454	+43.4	21 7 14.45
5	125	44 55 0.1	55 1.4	145.10	0.46	0.0039493	43.2	21 3 18.54
6	126	45 53 1.7	53 2.9	145.04	0.33	0.0040526	42.9	20 59 22.63
7	127	46 51 1.8	51 2.8	144.98	+ 0.20	0.0041552	+42.6	20 55 26.72
8	128	47 49 0.4	49 1.3	144.92	+ 0.07	0.0042570	42.3	20 51 30.81
9	129	48 46 57.7	46 58.4	144.86	− 0.06	0.0043579	41.9	20 47 34.90
10	130	49 44 53.7	44 54.3	144.81	− 0.18	0.0044578	+41.4	20 43 38.99
11	131	50 42 48.4	42 48.9	144.76	0.27	0.0045566	40.9	20 39 43.08
12	132	51 40 41.9	40 42.2	144.71	0.34	0.0046541	40.3	20 35 47.17
13	133	52 38 34.1	38 34.3	144.66	− 0.38	0.0047501	+39.7	20 31 51.26
14	134	53 36 25.1	36 25.1	144.60	0.39	0.0048445	39.0	20 27 55.35
15	135	54 34 14.9	34 14.7	144.55	0.37	0.0049371	38.2	20 23 59.44
16	136	55 32 3.5	32 3.2	144.50	− 0.33	0.0050278	+37.4	20 20 3.53
17	137	56 29 50.9	29 50.5	144.45	0.25	0.0051165	36.5	20 16 7.62
18	138	57 27 37.0	27 36.4	144.39	0.16	0.0052031	35.6	20 12 11.71
19	139	58 25 21.7	25 20.9	144.33	− 0.05	0.0052875	+34.7	20 8 15.80
20	140	59 23 5.0	23 4.0	144.27	+ 0.08	0.0053699	33.9	20 4 19.89
21	141	60 20 46.9	20 45.8	144.22	0.21	0.0054501	33.0	20 0 23.98
22	142	61 18 27.4	18 26.2	144.17	+ 0.34	0.0055281	+32.2	19 56 28.07
23	143	62 16 6.5	16 5.1	144.11	0.46	0.0056041	31.3	19 52 32.15
24	144	63 13 44.1	13 42.5	144.04	0.57	0.0056782	30.5	19 48 36.24
25	145	64 11 20.2	11 18.4	143.98	+ 0.65	0.0057503	+29.7	19 44 40.33
26	146	65 8 54.9	8 53.0	143.92	0.70	0.0058205	28.9	19 40 44.42
27	147	66 6 28.3	6 26.3	143.86	0.73	0.0058890	28.2	19 36 48.51
28	148	67 4 0.3	3 58.1	143.80	+ 0.73	0.0059560	+27.6	19 32 52.60
29	149	68 1 30.8	1 28.4	143.74	0.70	0.0060215	27.0	19 28 56.69
30	150	68 59 0.0	58 57.4	143.69	0.64	0.0060856	26.4	19 25 0.78
31	151	69 56 28.1	56 25.3	143.64	0.55	0.0061484	25.9	19 21 4.86
32	152	70 53 55.1	53 52.1	143.60	+ 0.44	0.0062099	+25.4	19 17 8.96

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January 0ᵈ.0.

Diff. for 1 Hour, —9ˢ.8296. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 18.0	15 23.6	56 2.4	+1.68	56 23.1	+1.75	9 45.6	1.85	12.2
2	15 29.4	15 35.3	56 44.4	1.78	57 5.9	1.78	10 30.4	1.91	13.2
3	15 41.1	15 46.7	57 27.2	1.75	57 48.0	1.69	11 17.2	2.01	14.2
4	15 52.1	15 57.1	58 7.8	+1.59	58 26.2	+1.46	12 6.7	2.14	15.2
5	16 1.7	16 5.7	58 42.9	1.31	58 57.6	1.13	12 59.9	2.29	16.2
6	16 9.1	16 11.9	59 10.1	0.95	59 20.3	0.75	13 56.8	2.44	17.2
7	16 14.0	16 15.4	59 28.0	+0.54	59 33.3	+0.34	14 56.9	2.54	18.2
8	16 16.2	16 16.4	59 36.2	+0.15	59 36.9	−0.03	15 58.5	2.55	19.2
9	16 16.0	16 15.1	59 35.5	−0.20	59 32.2	0.35	16 59.5	2.49	20.2
10	16 13.8	16 12.0	59 27.2	−0.48	59 20.8	−0.59	17 58.0	2.36	21.2
11	16 9.9	16 7.5	59 13.1	0.69	59 4.3	0.77	18 53.0	2.22	22.2
12	16 4.9	16 2.0	58 54.6	0.81	58 44.1	0.91	19 44.7	2.10	23.2
13	15 58.9	15 55.7	58 32.8	−0.97	58 20.9	−1.02	20 33.6	2.00	24.2
14	15 52.3	15 48.7	58 8.4	1.07	57 55.3	1.11	21 20.8	1.95	25.2
15	15 45.0	15 41.2	57 41.7	1.15	57 27.6	1.19	22 7.3	1.94	26.2
16	15 37.2	15 33.2	57 13.1	−1.23	56 58.2	−1.26	22 54.0	1.96	27.2
17	15 29.0	15 24.8	56 42.9	1.28	56 27.5	1.29	23 41.6	2.01	28.2
18	15 20.6	15 16.4	56 12.0	1.29	55 56.6	1.27	☌		29.2
19	15 12.3	15 8.3	55 41.5	−1.24	55 26.8	−1.20	0 30.5	2.06	0.7
20	15 4.5	15 0.9	55 12.8	1.13	54 59.7	1.05	1 20.5	2.10	1.7
21	14 57.7	14 54.7	54 47.7	0.95	54 37.0	0.83	2 11.4	2.12	2.7
22	14 52.2	14 50.2	54 27.8	−0.69	54 20.3	−0.54	3 2.1	2.10	3.7
23	14 48.7	14 47.7	54 14.8	−0.38	54 11.3	−0.20	3 52.0	2.05	4.7
24	14 47.4	14 47.7	54 10.1	0.00	54 11.2	+0.20	4 40.3	1.97	5.7
25	14 48.7	14 50.4	54 14.8	+0.40	54 20.9	+0.61	5 26.8	1.90	6.7
26	14 52.7	14 55.7	54 29.5	0.83	54 40.7	1.04	6 11.5	1.84	7.7
27	14 59.3	15 3.6	54 54.4	1.24	55 10.5	1.43	6 55.1	1.81	8.7
28	15 8.6	15 14.2	55 28.8	+1.61	55 49.2	+1.78	7 38.2	1.81	9.7
29	15 20.3	15 26.9	56 11.5	1.92	56 35.2	2.02	8 21.8	1.85	10.7
30	15 33.7	15 40.6	57 0.0	2.10	57 25.5	2.14	9 6.9	1.93	11.7
31	15 47.6	15 54.5	57 51.2	2.13	58 16.6	2.08	9 54.7	2.06	12.7
32	16 1.2	16 7.5	58 41.1	+1.98	59 4.1	+1.84	10 46.3	2.24	13.7

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 1.					SATURDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	12 5 36.52	1.9429	N. 4 59 7.7	12.898	0	13 40 56.38	2.0532	S. 5 44 17.4	13.526
1	12 7 33.12	1.9437	4 46 12.7	12.933	1	13 42 59.68	2.0570	5 57 48.6	13.512
2	12 9 29.77	1.9447	4 33 15.7	12.967	2	13 45 3.22	2.0610	6 11 18.9	13.497
3	12 11 26.48	1.9457	4 20 16.7	13.000	3	13 47 7.00	2.0650	6 24 48.3	13.482
4	12 13 23.25	1.9467	4 7 15.7	13.033	4	13 49 11.02	2.0690	6 38 16.7	13.465
5	12 15 20.08	1.9477	3 54 12.7	13.066	5	13 51 15.28	2.0730	6 51 44.1	13.447
6	12 17 16.98	1.9489	3 41 7.8	13.097	6	13 53 19.78	2.0771	7 5 10.3	13.427
7	12 19 13.95	1.9502	3 28 1.1	13.127	7	13 55 24.53	2.0813	7 18 35.3	13.406
8	12 21 11.00	1.9514	3 14 52.6	13.156	8	13 57 29.54	2.0856	7 31 59.0	13.383
9	12 23 8.12	1.9527	3 1 42.4	13.184	9	13 59 34.80	2.0899	7 45 21.3	13.359
10	12 25 5.32	1.9541	2 48 30.5	13.212	10	14 1 40.32	2.0942	7 58 42.1	13.334
11	12 27 2.61	1.9556	2 35 17.0	13.238	11	14 3 46.11	2.0987	8 12 1.4	13.308
12	12 28 59.99	1.9571	2 22 2.0	13.264	12	14 5 52.17	2.1032	8 25 19.1	13.281
13	12 30 57.46	1.9586	2 8 45.4	13.289	13	14 7 58.50	2.1077	8 38 35.1	13.252
14	12 32 55.03	1.9602	1 55 27.3	13.312	14	14 10 5.10	2.1123	8 51 49.3	13.221
15	12 34 52.69	1.9619	1 42 7.9	13.335	15	14 12 11.98	2.1170	9 5 1.6	13.189
16	12 36 50.46	1.9637	1 28 47.1	13.357	16	14 14 19.14	2.1217	9 18 12.0	13.157
17	12 38 48.34	1.9656	1 15 25.0	13.379	17	14 16 26.58	2.1264	9 31 20.4	13.123
18	12 40 46.33	1.9675	1 2 1.6	13.400	18	14 18 34.31	2.1313	9 44 26.7	13.087
19	12 42 44.44	1.9694	0 48 37.0	13.419	19	14 20 42.33	2.1362	9 57 30.8	13.049
20	12 44 42.66	1.9713	0 35 11.3	13.436	20	14 22 50.65	2.1411	10 10 32.6	13.010
21	12 46 41.00	1.9734	0 21 44.6	13.453	21	14 24 59.26	2.1460	10 23 32.0	12.970
22	12 48 39.47	1.9756	N. 0 8 16.9	13.470	22	14 27 8.17	2.1511	10 36 29.0	12.928
23	12 50 38.07	1.9778	S. 0 5 11.8	13.487	23	14 29 17.39	2.1562	S. 10 49 23.4	12.885
	FRIDAY 2.					SUNDAY 4.			
0	12 52 36.80	1.9800	S. 0 18 41.5	13.502	0	14 31 26.91	2.1613	S. 11 2 15.2	12.841
1	12 54 35.67	1.9823	0 32 12.0	13.514	1	14 33 36.74	2.1664	11 15 4.3	12.795
2	12 56 34.68	1.9847	0 45 43.2	13.526	2	14 35 46.88	2.1716	11 27 50.6	12.747
3	12 58 33.84	1.9872	0 59 15.1	13.537	3	14 37 57.34	2.1769	11 40 34.0	12.698
4	13 0 33.15	1.9897	1 12 47.7	13.548	4	14 40 8.11	2.1822	11 53 14.4	12.648
5	13 2 32.61	1.9922	1 26 20.9	13.557	5	14 42 19.20	2.1876	12 5 51.7	12.596
6	13 4 32.22	1.9948	1 39 54.6	13.566	6	14 44 30.62	2.1930	12 18 25.9	12.542
7	13 6 31.99	1.9976	1 53 28.8	13.573	7	14 46 42.36	2.1984	12 30 56.8	12.487
8	13 8 31.93	2.0004	2 7 3.4	13.579	8	14 48 54.43	2.2039	12 43 24.4	12.431
9	13 10 32.04	2 0033	2 20 38.3	13.584	9	14 51 6.83	2.2094	12 55 48.5	12.372
10	13 12 32.32	2.0062	2 34 13.5	13.588	10	14 53 19.56	2.2150	13 8 9.1	12.313
11	13 14 32.78	2.0091	2 47 48.9	13.591	11	14 55 32.63	2.2206	13 20 26.1	12.252
12	13 16 33.41	2.0120	3 1 24.4	13.592	12	14 57 46.03	2.2262	13 32 39.4	12.190
13	13 18 34.22	2.0151	3 15 0.0	13.593	13	14 59 59.77	2.2319	13 44 48.9	12.126
14	13 20 35.22	2.0183	3 28 35.6	13.593	14	15 2 13.85	2.2376	13 56 54.5	12.060
15	13 22 36.42	2.0216	3 42 11.2	13.592	15	15 4 28.28	2.2433	14 8 56.1	11.992
16	13 24 37.81	2.0249	3 55 46.7	13.590	16	15 6 43.05	2.2491	14 20 53.6	11.923
17	13 26 39.40	2.0282	4 9 22.0	13.586	17	15 8 58.17	2.2549	14 32 46.9	11.853
18	13 28 41.19	2.0315	4 22 57.0	13.580	18	15 11 13.64	2.2607	14 44 35.9	11.781
19	13 30 43.18	2.0349	4 36 31.6	13.574	19	15 13 29.46	2.2666	14 56 20.6	11.707
20	13 32 45.38	2.0385	4 50 5.8	13.567	20	15 15 45.63	2.2724	15 8 0.8	11.632
21	13 34 47.80	2.0422	5 3 39.6	13.559	21	15 18 2.15	2.2783	15 19 36.4	11.555
22	13 36 50.44	2.0458	5 17 12.9	13.549	22	15 20 19.03	2.2842	15 31 7.4	11.477
23	13 38 53.30	2.0495	5 30 45.5	13.538	23	15 22 36.26	2.2902	15 42 33.6	11.397
24	13 40 56.38	2.0532	S. 5 44 17 4	13.526	24	15 24 53.85	2.2962	S. 15 53 55.0	11.315

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 5.					WEDNESDAY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	15 24 53.85	2.2962	S.15 53 55.0	11.315	0	17 21 48.70	2.5607	S.22 53 6.9	5.584
1	15 27 11.80	2.3022	16 5 11.4	11.232	1	17 24 22.46	2.5647	22 58 37.4	5.432
2	15 29 30.11	2.3081	16 16 22.8	11.147	2	17 26 56.47	2.5687	23 3 58.7	5.278
3	15 31 48.77	2.3140	16 27 29.1	11.061	3	17 29 30.71	2.5726	23 9 10.7	5.123
4	15 34 7.79	2.3201	16 38 30.1	10.972	4	17 32 5.18	2.5763	23 14 13.4	4.967
5	15 36 27.18	2.3262	16 49 25.8	10.883	5	17 34 39.87	2.5800	23 19 6.7	4.810
6	15 38 46.93	2.3322	17 0 16.1	10.793	6	17 37 14.78	2.5836	23 23 50.6	4.652
7	15 41 7.04	2.3382	17 11 0.9	10.699	7	17 39 49.90	2.5870	23 28 25.0	4.493
8	15 43 27.51	2.3442	17 21 40.0	10.604	8	17 42 25.22	2.5902	23 32 49.8	4.334
9	15 45 48.34	2.3502	17 32 13.4	10.508	9	17 45 0.73	2.5934	23 37 5.1	4.174
10	15 48 9.53	2.3562	17 42 41.0	10.411	10	17 47 36.43	2.5965	23 41 10.7	4.013
11	15 50 31.09	2.3623	17 53 2.7	10.311	11	17 50 12.31	2.5995	23 45 6.6	3.851
12	15 52 53.01	2.3683	18 3 18.3	10.209	12	17 52 48.37	2.6023	23 48 52.8	3.688
13	15 55 15.29	2.3743	18 13 27.8	10.107	13	17 55 24.59	2.6050	23 52 29.2	3.524
14	15 57 37.93	2.3803	18 23 31.2	10.004	14	17 58 0.97	2.6077	23 55 55.7	3.360
15	16 0 0.93	2.3863	18 33 28.3	9.898	15	18 0 37.51	2.6102	23 59 12.4	3.196
16	16 2 24.29	2.3923	18 43 19.0	9.791	16	18 3 14.19	2.6124	24 2 19.2	3.030
17	16 4 48.01	2.3982	18 53 3.2	9.682	17	18 5 51.00	2.6146	24 5 16.0	2.864
18	16 7 12.08	2.4042	19 2 40.8	9.572	18	18 8 27.94	2.6167	24 8 2.9	2.698
19	16 9 36.51	2.4102	19 12 11.8	9.460	19	18 11 5.00	2.6187	24 10 39.8	2.531
20	16 12 1.30	2.4161	19 21 36.0	9.346	20	18 13 42.18	2.6205	24 13 6.6	2.363
21	16 14 26.44	2.4219	19 30 53.3	9.231	21	18 16 19.46	2.6222	24 15 23.3	2.194
22	16 16 51.93	2.4277	19 40 3.7	9.114	22	18 18 56.84	2.6237	24 17 29.9	2.026
23	16 19 17.77	2.4335	S.19 49 7.0	8.996	23	18 21 34.30	2.6250	S.24 19 26.4	1.857
	TUESDAY 6.					THURSDAY 8.			
0	16 21 43.95	2.4393	S.19 58 3.2	8.877	0	18 24 11.84	2.6263	S.24 21 12.8	1.688
1	16 24 10.48	2.4450	20 6 52.2	8.756	1	18 26 49.46	2.6275	24 22 49.0	1.518
2	16 26 37.35	2.4507	20 15 33.9	8.632	2	18 29 27.14	2.6284	24 24 15.0	1.349
3	16 29 4.56	2.4563	20 24 8.1	8.507	3	18 32 4.87	2.6292	24 25 30.9	1.180
4	16 31 32.11	2.4620	20 32 34.8	8.382	4	18 34 42.65	2.6300	24 26 36.6	1.009
5	16 34 0.00	2.4676	20 40 54.0	8.256	5	18 37 20.47	2.6306	24 27 32.0	0.838
6	16 36 28.22	2.4731	20 49 5.5	8.127	6	18 39 58.32	2.6310	24 28 17.1	0.667
7	16 38 56.77	2.4785	20 57 9.2	7.997	7	18 42 36.19	2.6312	24 28 52.0	0.497
8	16 41 25.64	2.4839	21 5 5.1	7.866	8	18 45 14.07	2.6314	24 29 16.7	0.327
9	16 43 54.84	2.4893	21 12 53.1	7.733	9	18 47 51.96	2.6314	24 29 31.2	− 0.156
10	16 46 24.36	2.4946	21 20 33.1	7.599	10	18 50 29.84	2.6313	24 29 35.4	+ 0.016
11	16 48 54.19	2.4998	21 28 5.0	7.463	11	18 53 7.72	2.6312	24 29 29.3	0.187
12	16 51 24.33	2.5049	21 35 28.7	7.326	12	18 55 45.58	2.6308	24 29 13.0	0.357
13	16 53 54.78	2.5100	21 42 44.1	7.187	13	18 58 23.41	2.6302	24 28 46.5	0.527
14	16 56 25.53	2.5150	21 49 51.2	7.048	14	19 1 1.20	2.6295	24 28 9.7	0.698
15	16 58 56.58	2.5200	21 56 49.9	6.907	15	19 3 38.95	2.6287	24 27 22.7	0.868
16	17 1 27.93	2.5249	22 3 40.1	6.765	16	19 6 16.64	2.6277	24 26 25.5	1.038
17	17 3 59.57	2.5297	22 10 21.7	6.623	17	19 8 54.27	2.6266	24 25 18.1	1.208
18	17 6 31.49	2.5343	22 16 54.7	6.478	18	19 11 31.83	2.6253	24 24 0.5	1.378
19	17 9 3.69	2.5389	22 23 19.0	6.332	19	19 14 9.31	2.6240	24 22 32.7	1.547
20	17 11 36.16	2.5434	22 29 34.5	6.184	20	19 16 46.71	2.6225	24 20 54.8	1.716
21	17 14 8.90	2.5479	22 35 41.1	6.035	21	19 19 24.01	2.6208	24 19 6.8	1.884
22	17 16 41.91	2.5523	22 41 38.7	5.885	22	19 22 1.21	2.6191	24 17 8.7	2.052
23	17 19 15.18	2.5566	22 47 27.3	5.735	23	19 24 38.30	2.6173	24 15 0.5	2.220
24	17 21 48.70	2.5607	S.22 53 6.9	5.584	24	19 27 15.28	2.6153	S.24 12 42.3	2.387

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 9.

Hour	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	19 27 15.28	2.6153	S.24 12 42.3	2.387
1	19 29 52.13	2.6131	24 10 14.1	2.553
2	19 32 28.85	2.6108	24 7 35.9	2.720
3	19 35 5.43	2.6084	24 4 47.7	2.886
4	19 37 41.86	2.6058	24 1 49.6	3.051
5	19 40 18.13	2.6032	23 58 41.6	3.215
6	19 42 54.24	2.6004	23 55 23.8	3.378
7	19 45 30.18	2.5976	23 51 56.2	3.541
8	19 48 5.95	2.5947	23 48 18.9	3.703
9	19 50 41.54	2.5916	23 44 31.8	3.865
10	19 53 16.94	2.5884	23 40 35.1	4.025
11	19 55 52.14	2.5851	23 36 28.8	4.185
12	19 58 27.15	2.5817	23 32 12.9	4.344
13	20 1 1.95	2.5782	23 27 47.5	4.502
14	20 3 36.53	2.5745	23 23 12.6	4.660
15	20 6 10.89	2.5707	23 18 28.3	4.816
16	20 8 45.02	2.5669	23 13 34.7	4.971
17	20 11 18.92	2.5631	23 8 31.8	5.125
18	20 13 52.59	2.5591	23 3 19.7	5.278
19	20 16 26.01	2.5549	22 57 58.4	5.431
20	20 18 59.18	2.5507	22 52 28.0	5.582
21	20 21 32.10	2.5465	22 46 48.5	5.733
22	20 24 4.76	2.5422	22 41 0.0	5.882
23	20 26 37.16	2.5378	S.22 35 2.6	6.030

SATURDAY 10.

Hour	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	20 29 9.29	2.5332	S.22 28 56.4	6.177
1	20 31 41.14	2.5286	22 22 41.4	6.323
2	20 34 12.72	2.5240	22 16 17.7	6.468
3	20 36 44.02	2.5192	22 9 45.3	6.612
4	20 39 15.03	2.5144	22 3 4.3	6.754
5	20 41 45 75	2.5096	21 56 14.8	6.895
6	20 44 16.19	2.5048	21 49 16.9	7.035
7	20 46 46.33	2.4998	21 42 10.6	7.173
8	20 49 16.17	2.4948	21 34 56.1	7.310
9	20 51 45.71	2.4897	21 27 33.4	7.447
10	20 54 14.94	2.4846	21 20 2.5	7.583
11	20 56 43.86	2.4794	21 12 23.5	7.716
12	20 59 12.47	2.4742	21 4 36.6	7.847
13	21 1 40.77	2.4690	20 56 41.8	7.978
14	21 4 8.75	2.4637	20 48 39.2	8.108
15	21 6 36.42	2.4584	20 40 28.8	8.237
16	21 9 3.76	2.4530	20 32 10.7	8.364
17	21 11 30.78	2.4476	20 23 45.1	8.489
18	21 13 57.48	2.4422	20 15 12.0	8.613
19	21 16 23.85	2.4367	20 6 31.5	8.737
20	21 18 49.89	2.4313	19 57 43.6	8.858
21	21 21 15.61	2.4259	19 48 48.5	8.978
22	21 23 41.00	2.4203	19 39 46.2	9.097
23	21 26 6.05	2.4147	19 30 36.9	9.213
24	21 28 30.77	2.4092	S.19 21 20.6	9.329

SUNDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	21 28 30.77	2.4092	S.19 21 20.6	9.329
1	21 30 55.16	2.4037	19 11 57.4	9.443
2	21 33 19.22	2.3982	19 2 27.4	9.557
3	21 35 42.94	2.3926	18 52 50.6	9.668
4	21 38 6.33	2.3871	18 43 7.1	9.779
5	21 40 29.39	2.3815	18 33 17.1	9.887
6	21 42 52.11	2.3759	18 23 20.7	9.994
7	21 45 14.50	2.3703	18 13 17.9	10.100
8	21 47 36.55	2.3647	18 3 8.7	10.205
9	21 49 58.27	2.3592	17 52 53.3	10.308
10	21 52 19.66	2.3537	17 42 31.8	10.409
11	21 54 40.72	2.3482	17 32 4.2	10.509
12	21 57 1.44	2.3426	17 21 30.7	10.607
13	21 59 21.83	2.3371	17 10 51.3	10.705
14	22 1 41.89	2.3317	17 0 6.1	10.800
15	22 4 1.63	2.3262	16 49 15.3	10.894
16	22 6 21.04	2.3207	16 38 18.9	10.987
17	22 8 40.12	2.3152	16 27 16.9	11.078
18	22 10 58.87	2.3098	16 16 9.5	11.168
19	22 13 17.30	2.3045	16 4 56.8	11.256
20	22 15 35.41	2.2991	15 53 38.8	11.343
21	22 17 53.19	2.2938	15 42 15.6	11.429
22	22 20 10.66	2.2885	15 30 47.4	11.512
23	22 22 27.81	2.2832	S.15 19 14.2	11.595

MONDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	22 24 44.65	2.2780	S.15 7 36.0	11.677
1	22 27 1.17	2.2728	14 55 53.0	11.756
2	22 29 17.38	2.2676	14 44 5.3	11.833
3	22 31 33.28	2.2625	14 32 13.0	11.910
4	22 33 48.88	2.2575	14 20 16.1	11.986
5	22 36 4.18	2.2525	14 8 14.7	12.059
6	22 38 19.18	2.2475	13 56 9.0	12.131
7	22 40 33.88	2.2425	13 43 59.0	12.202
8	22 42 48.28	2.2375	13 31 44.7	12.273
9	22 45 2.38	2.2326	13 19 26.2	12.342
10	22 47 16.19	2.2278	13 7 3.7	12.408
11	22 49 29.72	2.2231	12 54 37.3	12.473
12	22 51 42.96	2.2184	12 42 7.0	12.537
13	22 53 55.92	2.2137	12 29 32.9	12.599
14	22 56 8.60	2.2091	12 16 55.1	12.660
15	22 58 21.01	2.2045	12 4 13.7	12.720
16	23 0 33.14	2.1999	11 51 28.7	12.778
17	23 2 45.00	2.1955	11 38 40.3	12.835
18	23 4 56.60	2.1911	11 25 48.5	12.891
19	23 7 7.94	2.1867	11 12 53.4	12.945
20	23 9 19.01	2.1823	10 59 55.1	12.998
21	23 11 29.82	2.1781	10 46 53.7	13.049
22	23 13 40.38	2.1740	10 33 49.2	13.099
23	23 15 50.70	2.1699	10 20 41.8	13.147
24	23 18 0.77	2.1658	S.10 7 31.5	13.195

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	23 18 0.77	2.1658	S.10 7 31.5	13.196
1	23 20 10.59	2.1618	9 54 18.4	13.241
2	23 22 20.18	2.1578	9 41 2.6	13.286
3	23 24 29.53	2.1539	9 27 44.1	13.330
4	23 26 38.65	2.1501	9 14 23.0	13.372
5	23 28 47.54	2.1463	9 0 59.5	13.412
6	23 30 56.21	2.1426	8 47 33.6	13.451
7	23 33 4.66	2.1390	8 34 5.4	13.489
8	23 35 12.89	2.1353	8 20 34.9	13.526
9	23 37 20.90	2.1317	8 7 2.3	13.561
10	23 39 28.70	2.1283	7 53 27.6	13.595
11	23 41 36.30	2.1250	7 39 50.9	13.628
12	23 43 43.70	2.1217	7 26 12.2	13.660
13	23 45 50.90	2.1184	7 12 31.7	13.690
14	23 47 57.91	2.1152	6 58 49.4	13.719
15	23 50 4.73	2.1121	6 45 5.4	13.747
16	23 52 11.36	2.1089	6 31 19.8	13.773
17	23 54 17.80	2.1058	6 17 32.7	13.798
18	23 56 24.06	2.1029	6 3 44.1	13.822
19	23 58 30.15	2.1001	5 49 54.1	13.844
20	0 0 36.07	2.0973	5 36 2.8	13.866
21	0 2 41.83	2.0946	5 22 10.2	13.886
22	0 4 47.42	2.0919	5 8 16.5	13.904
23	0 6 52.85	2.0892	S. 4 54 21.7	13.922

WEDNESDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	0 8 58.13	2.0867	S. 4 40 25.8	13.940
1	0 11 3.26	2.0842	4 26 28.9	13.955
2	0 13 8.24	2.0818	4 12 31.2	13.967
3	0 15 13.08	2.0795	3 58 32.8	13.979
4	0 17 17.78	2.0772	3 44 33.7	13.991
5	0 19 22.34	2.0749	3 30 33.9	14.002
6	0 21 26.77	2.0728	3 16 33.5	14.011
7	0 23 31.08	2.0707	3 2 32.6	14.019
8	0 25 35.26	2.0687	2 48 31.2	14.026
9	0 27 39.32	2.0667	2 34 29.5	14.031
10	0 29 43.27	2.0649	2 20 27.5	14.035
11	0 31 47.11	2.0631	2 6 25.3	14.038
12	0 33 50.84	2.0614	1 52 22.9	14.040
13	0 35 54.47	2.0597	1 38 20.5	14.040
14	0 37 58.00	2.0580	1 24 18.1	14.040
15	0 40 1.43	2.0564	1 10 15.7	14.039
16	0 42 4.77	2.0549	0 56 13.4	14.037
17	0 44 8.02	2.0535	0 42 11.3	14.032
18	0 46 11.19	2.0522	0 28 9.5	14.027
19	0 48 14.28	2.0509	0 14 8.1	14.020
20	0 50 17.30	2.0496	S. 0 0 7.1	14.013
21	0 52 20.24	2.0484	N. 0 13 53.5	14.005
22	0 54 23.11	2.0473	0 27 53.5	13.995
23	0 56 25.92	2.0463	0 41 52.9	13.984
24	0 58 28.67	2.0453	N. 0 55 51.6	13.972

THURSDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	0 58 28.67	2.0453	N. 0 55 51.6	13.972
1	1 0 31.36	2.0444	1 9 49.6	13.959
2	1 2 34.00	2.0436	1 23 46.7	13.944
3	1 4 36.59	2.0428	1 37 42.9	13.929
4	1 6 39.14	2.0421	1 51 38.2	13.913
5	1 8 41.65	2.0414	2 5 32.5	13.895
6	1 10 44.11	2.0408	2 19 25.6	13.876
7	1 12 46.54	2.0403	2 33 17.6	13.857
8	1 14 48.94	2.0398	2 47 8.4	13.836
9	1 16 51.32	2.0394	3 0 57.9	13.814
10	1 18 53.67	2.0390	3 14 46.1	13.791
11	1 20 56.00	2.0387	3 28 32.8	13.766
12	1 22 58.32	2.0385	3 42 18.0	13.741
13	1 25 0.62	2.0383	3 56 1.7	13.715
14	1 27 2.91	2.0382	4 9 43.8	13.687
15	1 29 5.20	2.0381	4 23 24.1	13.658
16	1 31 7.48	2.0381	4 37 2.7	13.628
17	1 33 9.77	2.0382	4 50 39.5	13.597
18	1 35 12.06	2.0382	5 4 14.4	13.565
19	1 37 14.35	2.0383	5 17 47.3	13.532
20	1 39 16.66	2.0386	5 31 18.2	13.498
21	1 41 18.98	2.0389	5 44 47.1	13.464
22	1 43 21.32	2.0392	5 58 13.9	13.428
23	1 45 23.68	2.0395	N. 6 11 38.5	13.391

FRIDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	1 47 26.06	2.0399	N. 6 25 0.8	13.352
1	1 49 28.47	2.0404	6 38 20.8	13.313
2	1 51 30.91	2.0409	6 51 38.4	13.272
3	1 53 33.38	2.0415	7 4 53.5	13.231
4	1 55 35.89	2.0421	7 18 6.1	13.189
5	1 57 38.44	2.0428	7 31 16.2	13.146
6	1 59 41.03	2.0436	7 44 23.6	13.101
7	2 1 43.67	2.0443	7 57 28.3	13.056
8	2 3 46.35	2.0451	8 10 30.3	13.009
9	2 5 49.08	2.0460	8 23 29.4	12.961
10	2 7 51.87	2.0469	8 36 25.6	12.912
11	2 9 54.71	2.0478	8 49 18.9	12.863
12	2 11 57.61	2.0489	9 2 9.2	12.812
13	2 14 0.58	2.0500	9 14 56.4	12.761
14	2 16 3.61	2.0510	9 27 40.5	12.708
15	2 18 6.70	2.0521	9 40 21.4	12.655
16	2 20 9.86	2.0533	9 52 59.1	12.600
17	2 22 13.10	2.0546	10 5 33.4	12.544
18	2 24 16.41	2.0558	10 18 4.4	12.488
19	2 26 19.80	2.0571	10 30 32.0	12.430
20	2 28 23.27	2.0585	10 42 56.0	12.371
21	2 30 26.82	2.0598	10 55 16.5	12.312
22	2 32 30.45	2.0612	11 7 33.4	12.251
23	2 34 34.17	2.0627	11 19 46.6	12.189
24	2 36 37.98	2.0642	N.11 31 56.1	12.127

6

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 17.					**MONDAY 19.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	2 36 37.98	2.0642	N.11 31 56.1	12.127	0	4 17 52.20	2.1580	N.19 44 42.1	8.084
1	2 38 41.88	2.0657	11 44 1.8	12.063	1	4 20 1.74	2.1600	19 52 44.1	7.981
2	2 40 45.87	2.0672	11 56 3.7	11.999	2	4 22 11.40	2.1619	20 0 39.9	7.877
3	2 42 49.95	2.0688	12 8 1.7	11.933	3	4 24 21.17	2.1638	20 8 29.4	7.772
4	2 44 54.13	2.0705	12 19 55.7	11.867	4	4 26 31.06	2.1658	20 16 12.6	7.667
5	2 46 58.41	2.0722	12 31 45.7	11.800	5	4 28 41.06	2.1677	20 23 49.5	7.562
6	2 49 2.79	2.0738	12 43 31.7	11.732	6	4 30 51.18	2.1696	20 31 20.0	7.455
7	2 51 7.27	2.0755	12 55 13.5	11.662	7	4 33 1.41	2.1714	20 38 44.1	7.348
8	2 53 11.85	2.0773	13 6 51.1	11.592	8	4 35 11.75	2.1733	20 46 1.8	7.241
9	2 55 16.54	2.0791	13 18 24.5	11.521	9	4 37 22.20	2.1751	20 53 13.0	7.133
10	2 57 21.34	2.0808	13 29 53.6	11.449	10	4 39 32.76	2.1768	21 0 17.7	7.024
11	2 59 26.24	2.0826	13 41 18.3	11.376	11	4 41 43.42	2.1785	21 7 15.9	6.915
12	3 1 31.25	2.0844	13 52 38.7	11.302	12	4 43 54.18	2.1803	21 14 7.5	6.805
13	3 3 36.37	2.0863	14 3 54.6	11.227	13	4 46 5.05	2.1820	21 20 52.5	6.695
14	3 5 41.61	2.0882	14 15 5.9	11.151	14	4 48 16.02	2.1836	21 27 30.9	6.584
15	3 7 46.96	2.0901	14 26 12.7	11.075	15	4 50 27.08	2.1852	21 34 2.6	6.472
16	3 9 52.42	2.0920	14 37 14.9	10.997	16	4 52 38.24	2.1868	21 40 27.6	6.361
17	3 11 58.00	2.0940	14 48 12.4	10.919	17	4 54 49.49	2.1884	21 46 45.9	6.249
18	3 14 3.70	2.0960	14 59 5.2	10.840	18	4 57 0.84	2.1899	21 52 57.5	6.137
19	3 16 9.52	2.0980	15 9 53.2	10.760	19	4 59 12.28	2.1913	21 59 2.3	6.023
20	3 18 15.46	2.1000	15 20 36.4	10.679	20	5 1 23.80	2.1928	22 5 0.3	5.909
21	3 20 21.52	2.1020	15 31 14.7	10.597	21	5 3 35.41	2.1943	22 10 51.4	5.795
22	3 22 27.70	2.1040	15 41 48.1	10.514	22	5 5 47.11	2.1957	22 16 35.7	5.681
23	3 24 34.00	2.1060	N.15 52 16.4	10.430	23	5 7 58.89	2.1969	N.22 22 13.1	5.566
	SUNDAY 18.					**TUESDAY 20.**			
0	3 26 40.42	2.1081	N.16 2 39.7	10.346	0	5 10 10.74	2.1982	N.22 27 43.6	5.451
1	3 28 46.97	2.1102	16 12 57.9	10.261	1	5 12 22.67	2.1994	22 33 7.2	5.335
2	3 30 53.64	2.1122	16 23 11.0	10.175	2	5 14 34.67	2.2006	22 38 23.8	5.219
3	3 33 0.44	2.1143	16 33 18.9	10.088	3	5 16 46.74	2.2017	22 43 33.4	5.103
4	3 35 7.36	2.1164	16 43 21.6	10.001	4	5 18 58.88	2.2029	22 48 36.1	4.986
5	3 37 14.41	2.1185	16 53 19.0	9.912	5	5 21 11.09	2.2040	22 53 31.7	4.868
6	3 39 21.58	2.1206	17 3 11.0	9.822	6	5 23 23.36	2.2050	22 58 20.3	4.751
7	3 41 28.88	2.1227	17 12 57.6	9.732	7	5 25 35.69	2.2060	23 3 1.8	4.634
8	3 43 36.30	2.1248	17 22 38.8	9.642	8	5 27 48.08	2.2069	23 7 36.3	4.516
9	3 45 43.85	2.1269	17 32 14.6	9.551	9	5 30 0.52	2.2078	23 12 3.7	4.397
10	3 47 51.53	2.1291	17 41 44.9	9.457	10	5 32 13.01	2.2086	23 16 24.0	4.278
11	3 49 59.34	2.1312	17 51 9.5	9.363	11	5 34 25.55	2.2093	23 20 37.1	4.159
12	3 52 7.27	2.1333	18 0 28.5	9.269	12	5 36 38.13	2.2101	23 24 43.1	4.041
13	3 54 15.33	2.1354	18 9 41.8	9.174	13	5 38 50.76	2.2108	23 28 42.0	3.922
14	3 56 23.52	2.1375	18 18 49.4	9.079	14	5 41 3.43	2.2114	23 32 33.7	3.802
15	3 58 31.83	2.1396	18 27 51.3	8.983	15	5 43 16.13	2.2119	23 36 18.2	3.682
16	4 0 40.27	2.1417	18 36 47.4	8.886	16	5 45 28.86	2.2124	23 39 55.5	3.562
17	4 2 48.83	2.1437	18 45 37.6	8.788	17	5 47 41.62	2.2129	23 43 25.6	3.442
18	4 4 57.51	2.1457	18 54 21.9	8.689	18	5 49 54.41	2.2133	23 46 48.5	3.322
19	4 7 6.32	2.1478	19 3 0.3	8.591	19	5 52 7.22	2.2137	23 50 4.2	3.201
20	4 9 15.25	2.1498	19 11 32.8	8.492	20	5 54 20.05	2.2140	23 53 12.6	3.080
21	4 11 24.30	2.1519	19 19 59.3	8.391	21	5 56 32.90	2.2142	23 56 13.8	2.959
22	4 13 33.48	2.1540	19 28 19.7	8.289	22	5 58 45.76	2.2144	23 59 7.7	2.838
23	4 15 42.78	2.1560	19 36 34.0	8.187	23	6 0 58.63	2.2146	24 1 54.4	2.718
24	4 17 52.20	2.1580	N.19 44 42.1	8.084	24	6 3 11.51	2.2147	N.24 4 33.9	2.597

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	6 3 11.51	2.2147	N.24 4 33.9	2.597
1	6 5 24.39	2.2147	24 7 6.1	2.476
2	6 7 37.27	2.2147	24 9 31.0	2.354
3	6 9 50.15	2.2146	24 11 48.6	2.233
4	6 12 3.02	2.2144	24 13 58.9	2.112
5	6 14 15.88	2.2142	24 16 2.0	1.991
6	6 16 28.72	2.2139	24 17 57.8	1.869
7	6 18 41.55	2.2136	24 19 46.3	1.748
8	6 20 54.36	2.2133	24 21 27.5	1.627
9	6 23 7.14	2.2128	24 23 1.5	1.506
10	6 25 19.89	2.2123	24 24 28.2	1.384
11	6 27 32.61	2.2118	24 25 47.6	1.263
12	6 29 45.30	2.2112	24 26 59.7	1.142
13	6 31 57.95	2.2105	24 28 4.6	1.021
14	6 34 10.56	2.2097	24 29 2.2	0.899
15	6 36 23.12	2.2090	24 29 52.5	0.778
16	6 38 35.64	2.2082	24 30 35.6	0.658
17	6 40 48.10	2.2073	24 31 11.5	0.537
18	6 43 0.51	2.2063	24 31 40.1	0.417
19	6 45 12.86	2.2053	24 32 1.5	0.297
20	6 47 25.15	2.2043	24 32 15.7	0.176
21	6 49 37.37	2.2032	24 32 22.6	+ 0.056
22	6 51 49.53	2.2020	24 32 22.4	− 0.063
23	6 54 1.61	2.2007	N.24 32 15.0	0.183

THURSDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	6 56 13.62	2.1995	N.24 32 0.4	0.302
1	6 58 25.55	2.1982	24 31 38.7	0.422
2	7 0 37.40	2.1968	24 31 9.8	0.541
3	7 2 49.17	2.1954	24 30 33.8	0.660
4	7 5 0.85	2.1939	24 29 50.6	0.778
5	7 7 12.44	2.1923	24 29 0.4	0.896
6	7 9 23.93	2.1908	24 28 3.1	1.014
7	7 11 35.33	2.1892	24 26 58.7	1.132
8	7 13 46.63	2.1874	24 25 47.3	1.249
9	7 15 57.82	2.1857	24 24 28.9	1.366
10	7 18 8.91	2.1839	24 23 3.4	1.483
11	7 20 19.89	2.1821	24 21 30.9	1.599
12	7 22 30.76	2.1802	24 19 51.5	1.715
13	7 24 41.52	2.1783	24 18 5.1	1.831
14	7 26 52.16	2.1763	24 16 11.8	1.947
15	7 29 2.68	2.1743	24 14 11.5	2.062
16	7 31 13.08	2.1723	24 12 4.3	2.177
17	7 33 23.35	2.1702	24 9 50.3	2.291
18	7 35 33.50	2.1681	24 7 29.4	2.405
19	7 37 43.52	2.1659	24 5 1.7	2.518
20	7 39 53.41	2.1636	24 2 27.2	2.631
21	7 42 3.16	2.1613	23 59 45.9	2.744
22	7 44 12.77	2.1591	23 56 57.9	2.857
23	7 46 22.25	2.1568	23 54 3.1	2.969
24	7 48 31.59	2.1544	N.23 51 1.6	3.081

FRIDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	7 48 31.59	2.1544	N.23 51 1.6	3.081
1	7 50 40.78	2.1520	23 47 53.4	3.192
2	7 52 49.83	2.1496	23 44 38.6	3.302
3	7 54 58.73	2.1471	23 41 17.2	3.412
4	7 57 7.48	2.1446	23 37 49.2	3.522
5	7 59 16.08	2.1421	23 34 14.6	3.631
6	8 1 24.53	2.1395	23 30 33.5	3.740
7	8 3 32.82	2.1369	23 26 45.8	3.848
8	8 5 40.96	2.1343	23 22 51.7	3.956
9	8 7 48.94	2.1317	23 18 51.1	4.063
10	8 9 56.76	2.1290	23 14 44.1	4.170
11	8 12 4.42	2.1263	23 10 30.7	4.276
12	8 14 11.92	2.1236	23 6 11.0	4.382
13	8 16 19.25	2.1208	23 1 44.9	4.487
14	8 18 26.42	2.1181	22 57 12.5	4.592
15	8 20 33.42	2.1153	22 52 33.9	4.696
16	8 22 40.25	2.1124	22 47 49.0	4.800
17	8 24 46.91	2.1096	22 42 57.9	4.903
18	8 26 53.41	2.1068	22 38 0.6	5.006
19	8 28 59.73	2.1039	22 32 57.2	5.108
20	8 31 5.88	2.1011	22 27 47.7	5.209
21	8 33 11.86	2.0982	22 22 32.1	5.311
22	8 35 17.67	2.0953	22 17 10.4	5.412
23	8 37 23.30	2.0924	N.22 11 42.6	5.512

SATURDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	8 39 28.76	2.0895	N.22 6 8.9	5.611
1	8 41 34.04	2.0866	22 0 29.3	5.709
2	8 43 39.15	2.0837	21 54 43.8	5.808
3	8 45 44.08	2.0807	21 48 52.4	5.906
4	8 47 48.83	2.0777	21 42 55.1	6.003
5	8 49 53.41	2.0748	21 36 52.0	6.100
6	8 51 57.81	2.0718	21 30 43.1	6.196
7	8 54 2.03	2.0688	21 24 28.5	6.291
8	8 56 6.07	2.0659	21 18 8.2	6.386
9	8 58 9.94	2.0630	21 11 42.2	6.481
10	9 0 13.63	2.0600	21 5 10.5	6.574
11	9 2 17.14	2.0571	20 58 33.3	6.667
12	9 4 20.48	2.0542	20 51 50.5	6.760
13	9 6 23.64	2.0512	20 45 2.1	6.852
14	9 8 26.62	2.0482	20 38 8.2	6.943
15	9 10 29.43	2.0453	20 31 8.9	7.033
16	9 12 32.06	2.0423	20 24 4.2	7.123
17	9 14 34.51	2.0394	20 16 54.1	7.213
18	9 16 36.79	2.0366	20 9 38.6	7.302
19	9 18 38.90	2.0337	20 2 17.8	7.391
20	9 20 40.83	2.0308	19 54 51.7	7.479
21	9 22 42.59	2.0279	19 47 20.3	7.567
22	9 24 44.18	2.0250	19 39 43.7	7.653
23	9 26 45.59	2.0221	19 32 2.0	7.738
24	9 28 46.83	2.0192	N.19 24 15.1	7.824

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 25.					TUESDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	9 28 46.83	2.0192	N.19 24 15.1	7.824	0	11 2 56.55	1.9180	N.11 41 33.8	11.225
1	9 30 47.90	2.0164	19 16 23.1	7.909	1	11 4 51.60	1.9170	11 30 18.6	11.281
2	9 32 48.80	2.0137	19 8 26.0	7.993	2	11 6 46.59	1.9159	11 19 0.1	11.336
3	9 34 49.54	2.0109	19 0 23.9	8.077	3	11 8 41.51	1.9149	11 7 38.3	11.391
4	9 36 50.11	2.0082	18 52 16.8	8.160	4	11 10 36.38	1.9140	10 56 13.2	11.446
5	9 38 50.52	2.0054	18 44 4.7	8.243	5	11 12 31.19	1.9131	10 44 44.8	11.500
6	9 40 50.76	2.0027	18 35 47.6	8.326	6	11 14 25.95	1.9123	10 33 13.2	11.553
7	9 42 50.84	2.0000	18 27 25.6	8.407	7	11 16 20.66	1.9115	10 21 38.5	11.605
8	9 44 50.76	1.9973	18 18 58.8	8.487	8	11 18 15.33	1.9108	10 10 0.6	11.657
9	9 46 50.52	1.9947	18 10 27.2	8.567	9	11 20 9.96	1.9102	9 58 19.6	11.708
10	9 48 50.12	1.9920	18 1 50.8	8.646	10	11 22 4.55	1.9096	9 46 35.6	11.758
11	9 50 49.56	1.9893	17 53 9.7	8.724	11	11 23 59.11	1.9090	9 34 48.6	11.809
12	9 52 48.84	1.9867	17 44 23.9	8.803	12	11 25 53.63	1.9085	9 22 58.5	11.859
13	9 54 47.97	1.9842	17 35 33.4	8.881	13	11 27 48.13	1.9081	9 11 5.5	11.907
14	9 56 46.95	1.9817	17 26 38.2	8.958	14	11 29 42.61	1.9077	8 59 9.6	11.955
15	9 58 45.78	1.9792	17 17 38.4	9.035	15	11 31 37.06	1.9074	8 47 10.9	12.002
16	10 0 44.46	1.9767	17 8 34.0	9.111	16	11 33 31.50	1.9072	8 35 9.3	12.049
17	10 2 42.99	1.9743	16 59 25.1	9.186	17	11 35 25.92	1.9069	8 23 5.0	12.095
18	10 4 41.38	1.9720	16 50 11.7	9.261	18	11 37 20.33	1.9068	8 10 57.9	12.141
19	10 6 39.63	1.9696	16 40 53.8	9.335	19	11 39 14.74	1.9068	7 58 48.1	12.186
20	10 8 37.73	1.9672	16 31 31.5	9.408	20	11 41 9.15	1.9068	7 46 35.6	12.231
21	10 10 35.69	1.9649	16 22 4.8	9.481	21	11 43 3.55	1.9068	7 34 20.4	12.274
22	10 12 33.52	1.9627	16 12 33.8	9.554	22	11 44 57.96	1.9069	7 22 2.7	12.317
23	10 14 31.21	1.9604	N.16 2 58.4	9.626	23	11 46 52.38	1.9071	N. 7 9 42.4	12.359
	MONDAY 26.					WEDNESDAY 28.			
0	10 16 28.77	1.9582	N.15 53 18.7	9.697	0	11 48 46.81	1.9073	N. 6 57 19.6	12.401
1	10 18 26.20	1.9561	15 43 34.8	9.767	1	11 50 41.25	1.9076	6 44 54.3	12.442
2	10 20 23.50	1.9540	15 33 46.7	9.837	2	11 52 35.72	1.9080	6 32 26.6	12.482
3	10 22 20.68	1.9519	15 23 54.4	9.907	3	11 54 30.21	1.9084	6 19 56.5	12.522
4	10 24 17.73	1.9498	15 13 57.9	9.976	4	11 56 24.73	1.9089	6 7 24.0	12.561
5	10 26 14.65	1.9477	15 3 57.3	10.044	5	11 58 19.28	1.9094	5 54 49.2	12.599
6	10 28 11.45	1.9458	14 53 52.7	10.111	6	12 0 13.86	1.9100	5 42 12.1	12.637
7	10 30 8.14	1.9439	14 43 44.0	10.178	7	12 2 8.48	1.9107	5 29 32.8	12.674
8	10 32 4.72	1.9420	14 33 31.3	10.244	8	12 4 3.14	1.9114	5 16 51.3	12.710
9	10 34 1.18	1.9401	14 23 14.7	10.310	9	12 5 57.85	1.9122	5 4 7.6	12.746
10	10 35 57.53	1.9383	14 12 54.1	10.375	10	12 7 52.61	1.9131	4 51 21.8	12.780
11	10 37 53.78	1.9366	14 2 29.7	10.439	11	12 9 47.42	1.9140	4 38 34.0	12.813
12	10 39 49.93	1.9350	13 52 1.4	10.503	12	12 11 42.29	1.9150	4 25 44.2	12.847
13	10 41 45.98	1.9332	13 41 29.3	10.567	13	12 13 37.22	1.9160	4 12 52.4	12.880
14	10 43 41.92	1.9315	13 30 53.4	10.630	14	12 15 32.21	1.9172	3 59 58.6	12.912
15	10 45 37.76	1.9299	13 20 13.7	10.692	15	12 17 27.28	1.9185	3 47 3.0	12.943
16	10 47 33.51	1.9285	13 9 30.3	10.754	16	12 19 22.43	1.9198	3 34 5.5	12.973
17	10 49 29.18	1.9271	12 58 43.2	10.815	17	12 21 17.66	1.9211	3 21 6.2	13.002
18	10 51 24.76	1.9256	12 47 52.5	10.875	18	12 23 12.97	1.9225	3 8 5.2	13.031
19	10 53 20.25	1.9242	12 36 58.2	10.935	19	12 25 8.36	1.9240	2 55 2.5	13.059
20	10 55 15.66	1.9229	12 26 0.3	10.994	20	12 27 3.85	1.9256	2 41 58.1	13.087
21	10 57 11.00	1.9216	12 14 58.9	11.053	21	12 28 59.43	1.9272	2 28 52.0	13.114
22	10 59 6.26	1.9203	12 3 54.0	11.111	22	12 30 55.11	1.9288	2 15 44.4	13.139
23	11 1 1.44	1.9191	11 52 45.6	11.168	23	12 32 50.89	1.9306	2 2 35.3	13.163
24	11 2 56.55	1.9180	N.11 41 33.8	11.225	24	12 34 46.78	1.9324	N. 1 49 24.8	13.187

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	12 34 46.78	1.9324	N. 1 49 24.8	13.187
1	12 36 42.78	1.9343	1 36 12.8	13.211
2	12 38 38.90	1.9362	1 22 59.4	13.234
3	12 40 35.13	1.9382	1 9 44.7	13.256
4	12 42 31.49	1.9404	0 56 28.7	13.277
5	12 44 27.98	1.9426	0 43 11.5	13.296
6	12 46 24.60	1.9448	0 29 53.2	13.315
7	12 48 21.36	1.9471	0 16 33.7	13.334
8	12 50 18.26	1.9495	N. 0 3 13.1	13.352
9	12 52 15.30	1.9519	S. 0 10 8.5	13.368
10	12 54 12.49	1.9545	0 23 31.0	13.383
11	12 56 9.84	1.9571	0 36 54.4	13.398
12	12 58 7.34	1.9597	0 50 18.7	13.412
13	13 0 5.00	1.9624	1 3 43.8	13.424
14	13 2 2.83	1.9653	1 17 9.6	13.436
15	13 4 0.84	1.9682	1 30 36.1	13.447
16	13 5 59.02	1.9712	1 44 3.3	13.458
17	13 7 57.38	1.9742	1 57 31.1	13.468
18	13 9 55.92	1.9773	2 10 59.5	13.477
19	13 11 54.65	1.9805	2 24 28.3	13.483
20	13 13 53.58	1.9837	2 37 57.4	13.489
21	13 15 52.70	1.9870	2 51 26.9	13.494
22	13 17 52.02	1.9904	3 4 56.7	13.498
23	13 19 51.55	1.9939	S. 3 18 26.7	13.502

FRIDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	13 21 51.29	1.9975	S. 3 31 56.9	13.504
1	13 23 51.25	2.0011	3 45 27.2	13.505
2	13 25 51.42	2.0047	3 58 57.5	13.505
3	13 27 51.81	2.0084	4 12 27.8	13.504
4	13 29 52.43	2.0123	4 25 58.0	13.502
5	13 31 53.29	2.0162	4 39 28.0	13.499
6	13 33 54.38	2.0202	4 52 57.8	13.495
7	13 35 55.71	2.0242	5 6 27.4	13.490
8	13 37 57.29	2.0284	5 19 56.6	13.482
9	13 39 59.12	2.0326	5 33 25.3	13.474
10	13 42 1.20	2.0368	5 46 53.5	13.466
11	13 44 3.54	2.0412	6 0 21.2	13.457
12	13 46 6.14	2.0456	6 13 48.3	13.446
13	13 48 9.01	2.0501	6 27 14.7	13.433
14	13 50 12.15	2.0546	6 40 40.3	13.419
15	13 52 15.56	2.0592	6 54 5.0	13.404
16	13 54 19.25	2.0639	7 7 28.8	13.388
17	13 56 23.23	2.0687	7 20 51.6	13.372
18	13 58 27.49	2.0735	7 34 13.4	13.353
19	14 0 32.05	2.0784	7 47 34.0	13.333
20	14 2 36.90	2.0833	8 0 53.4	13.312
21	14 4 42.05	2.0883	8 14 11.5	13.290
22	14 6 47.50	2.0934	8 27 28.2	13.266
23	14 8 53.26	2.0987	8 40 43.4	13.240
24	14 10 59.34	2.1040	S. 8 53 57.0	13.213

SATURDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	14 10 59.34	2.1040	S. 8 53 57.0	13.213
1	14 13 5.74	2.1092	9 7 9.0	13.186
2	14 15 12.45	2.1145	9 20 19.4	13.158
3	14 17 19.48	2.1199	9 33 28.0	13.128
4	14 19 26.84	2.1255	9 46 34.7	13.096
5	14 21 34.54	2.1311	9 59 39.5	13.063
6	14 23 42.57	2.1467	10 12 42.2	13.028
7	14 25 50.94	2.1423	10 25 42.8	12.992
8	14 27 59.65	2.1481	10 38 41.2	12.954
9	14 30 8.71	2.1539	10 51 37.3	12.916
10	14 32 18.12	2.1598	11 4 31.1	12.876
11	14 34 27.89	2.1657	11 17 22.4	12.833
12	14 36 38.01	2.1717	11 30 11.1	12.790
13	14 38 48.49	2.1778	11 42 57.2	12.745
14	14 40 59.34	2.1839	11 55 40.5	12.698
15	14 43 10.56	2.1901	12 8 21.0	12.651
16	14 45 22.15	2.1962	12 20 58.6	12.601
17	14 47 34.11	2.2024	12 33 33.1	12.549
18	14 49 46.44	2.2087	12 46 4.5	12.497
19	14 51 59.15	2.2151	12 58 32.7	12.443
20	14 54 12.25	2.2216	13 10 57.6	12.387
21	14 56 25.74	2.2281	13 23 19.1	12.329
22	14 58 39.62	2.2346	13 35 37.1	12.270
23	15 0 53.89	2.2411	S. 13 47 51.5	12.210

SUNDAY, JUNE 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	15 3 8.55	2.2477	S. 14 0 2.3	12.148

PHASES OF THE MOON.

		d	h	m
○ Full Moon . . .	May	4	9	8.9
☾ Last Quarter		11	4	21.6
● New Moon		18	8	18.5
☽ First Quarter		26	10	33.9

		d	h
☾ Perigee	May	8	10.4
☾ Apogee		24	0.2

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Aldebaran	W.	111° 23′ 10″	2766	112° 58′ 22″	2752	114° 33′ 52″	2739	116° 9′ 40″	2725
	Pollux	W.	67 12 38	2768	68 47 47	2754	70 23 15	2740	71 59 2	2725
	Regulus	W.	31 17 56	2794	32 52 31	2778	34 27 28	2759	36 2 49	2743
	Antares	E.	69 31 38	2782	67 56 47	2768	66 21 37	2755	64 46 10	2740
	Mars	E.	73 37 30	2722	72 1 20	2708	70 24 51	2693	68 48 2	2679
2	Pollux	W.	80 2 52	2651	81 40 38	2637	83 18 43	2622	84 57 7	2607
	Saturn	W.	45 13 22	2651	46 51 7	2637	48 29 12	2622	50 7 37	2606
	Regulus	W.	44 5 1	2661	45 42 32	2645	47 20 24	2630	48 58 38	2615
	Antares	E.	56 44 22	2674	55 7 7	2660	53 29 34	2648	51 51 43	2635
	Mars	E.	60 39 0	2603	59 0 11	2588	57 21 2	2574	55 41 32	2560
	α Aquilæ	E.	103 5 58	3406	101 43 49	3384	100 21 14	3362	98 58 14	3340
3	Pollux	W.	93 14 6	2537	94 54 28	2524	96 35 8	2510	98 16 8	2496
	Saturn	W.	58 24 45	2535	60 5 10	2522	61 45 54	2509	63 26 56	2494
	Regulus	W.	57 14 57	2540	58 55 14	2526	60 35 50	2512	62 16 47	2499
	Antares	E.	43 38 20	2576	41 58 53	2566	40 19 12	2556	38 39 17	2547
	Mars	E.	47 19 4	2488	45 37 34	2474	43 55 45	2460	42 13 37	2447
	α Aquilæ	E.	91 57 26	3251	90 32 17	3238	89 6 53	3224	87 41 13	3213
	Jupiter	E.	105 30 23	2559	103 50 32	2545	102 10 22	2531	100 29 52	2516
4	Pollux	W.	106 45 37	2434	108 28 23	2423	110 11 25	2411	111 54 43	2400
	Saturn	W.	71 56 48	2430	73 39 39	2419	75 22 48	2407	77 6 12	2395
	Regulus	W.	70 46 10	2433	72 28 57	2421	74 12 0	2409	75 55 20	2398
	Mars	E.	33 38 19	2385	31 54 22	2374	30 10 9	2363	28 25 40	2352
	α Aquilæ	E.	80 29 59	3175	79 3 22	3173	77 36 41	3172	76 9 59	3173
	Jupiter	E.	92 2 47	2453	90 20 28	2442	88 37 53	2430	86 55 1	2418
5	Saturn	W.	85 47 7	2345	87 32 1	2336	89 17 8	2327	91 2 26	2319
	Regulus	W.	84 35 57	2346	86 20 47	2336	88 5 51	2328	89 51 8	2321
	Spica	W.	30 57 41	2442	32 40 16	2424	34 23 18	2407	36 6 43	2392
	α Aquilæ	E.	68 57 23	3206	67 31 20	3218	66 5 33	3235	64 40 6	3254
	Jupiter	E.	78 16 49	2368	76 32 27	2359	74 47 52	2350	73 3 5	2341
	Fomalhaut	E.	99 43 57	2519	98 3 10	2508	96 22 8	2499	94 40 53	2489
6	Regulus	W.	98 40 19	2286	100 26 39	2280	102 13 8	2274	103 59 44	2269
	Spica	W.	44 48 50	2331	46 34 4	2321	48 19 32	2314	50 5 11	2306
	α Aquilæ	E.	57 39 40	3402	56 17 26	3444	54 56 0	3493	53 35 28	3545
	Jupiter	E.	64 16 20	2306	62 30 29	2300	60 44 30	2295	58 58 23	2290
	Fomalhaut	E.	86 11 39	2454	84 29 20	2449	82 46 55	2445	81 4 24	2441
7	Spica	W.	58 55 59	2277	60 42 32	2273	62 29 11	2269	64 15 55	2266
	Jupiter	E.	50 6 16	2273	48 19 36	2271	46 32 53	2269	44 46 8	2268
	Fomalhaut	E.	72 30 58	2436	70 48 16	2438	69 5 36	2441	67 23 0	2445
	α Pegasi	E.	90 36 17	2651	88 58 32	2650	87 20 43	2648	85 42 54	2648
8	Spica	W.	73 10 28	2259	74 57 29	2258	76 44 30	2259	78 31 31	2259
	Antares	W.	27 28 13	2333	29 13 24	2323	30 58 50	2314	32 44 29	2307
	Jupiter	E.	35 52 14	2271	34 5 31	2272	32 18 52	2274	30 32 17	2278
	Fomalhaut	E.	58 51 43	2479	57 10 0	2489	55 28 32	2501	53 47 21	2514
	α Pegasi	E.	77 34 16	2665	75 56 50	2673	74 19 34	2681	72 42 29	2691
	Sun	E.	132 17 34	2541	130 37 18	2540	128 57 1	2540	127 16 45	2540

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Aldebaran	W.	117° 45′ 47″	2710	119° 22′ 13″	2697	120° 58′ 57″	2683	122° 36′ 0″	2668
	Pollux	W.	73 35 9	2710	75 11 35	2695	76 48 21	2680	78 25 27	2666
	Regulus	W.	37 38 31	2725	39 14 36	2708	40 51 2	2692	42 27 51	2677
	Antares	E.	63 10 24	2727	61 34 21	2713	59 57 59	2700	58 21 19	2687
	Mars	E.	67 10 54	2663	65 33 26	2647	63 55 37	2632	62 17 29	2619
2	Pollux	W.	86 35 52	2593	88 14 56	2579	89 54 20	2564	91 34 3	2550
	Saturn	W.	51 46 23	2591	53 25 29	2576	55 4 54	2562	56 44 40	2549
	Regulus	W.	50 37 12	2599	52 16 8	2584	53 55 24	2569	55 35 1	2555
	Antares	E.	50 13 36	2623	48 35 11	2610	46 56 30	2598	45 17 33	2587
	Mars	E.	54 1 42	2545	52 21 32	2531	50 41 3	2517	49 0 13	2503
	α Aquilæ	E.	97 34 47	3319	96 10 58	3300	94 46 47	3283	93 22 17	3267
3	Pollux	W.	99 57 26	2483	101 39 2	2470	103 20 57	2458	105 3 8	2446
	Saturn	W.	65 8 18	2481	66 49 59	2468	68 31 57	2455	70 14 14	2442
	Regulus	W.	63 58 2	2485	65 39 37	2472	67 21 30	2459	69 3 41	2446
	Antares	E.	36 59 10	2540	35 18 53	2532	33 38 25	2527	31 57 50	2522
	Mars	E.	40 31 10	2434	38 48 24	2421	37 5 20	2409	35 21 58	2397
	α Aquilæ	E.	86 15 19	3202	84 49 13	3194	83 22 57	3187	81 56 32	3180
	Jupiter	E.	98 49 4	2504	97 7 57	2491	95 26 31	2479	93 44 48	2466
4	Pollux	W.	113 38 17	2390	115 22 5	2380	117 6 8	2370	118 50 25	2361
	Saturn	W.	78 49 53	2384	80 33 49	2374	82 18 1	2364	84 2 27	2354
	Regulus	W.	77 38 57	2387	79 22 50	2377	81 6 58	2366	82 51 20	2356
	Mars	E.	26 40 56	2342	24 55 59	2332	23 10 47	2322	21 25 21	2313
	α Aquilæ	E.	74 43 17	3175	73 16 38	3179	71 50 4	3186	70 23 38	3195
	Jupiter	E.	85 11 53	2407	83 28 29	2397	81 44 50	2387	80 0 57	2378
5	Saturn	W.	92 47 58	2311	94 33 41	2304	96 19 35	2297	98 5 39	2290
	Regulus	W.	91 36 36	2313	93 22 16	2306	95 8 7	2299	96 54 8	2292
	Spica	W.	37 50 32	2377	39 34 40	2363	41 19 7	2352	43 3 51	2341
	α Aquilæ	E.	63 15 1	3275	61 50 21	3300	60 26 12	3330	59 2 37	3364
	Jupiter	E.	71 18 6	2333	69 32 55	2326	67 47 33	2319	66 2 1	2312
	Fomalhaut	E.	92 59 24	2480	91 17 43	2472	89 35 51	2465	87 53 49	2459
6	Regulus	W.	105 46 28	2265	107 33 18	2261	109 20 14	2258	111 7 15	2255
	Spica	W.	51 51 2	2299	53 37 3	2292	55 23 14	2287	57 9 33	2282
	α Aquilæ	E.	52 15 54	3606	50 57 26	3673	49 40 10	3749	48 24 15	3832
	Jupiter	E.	57 12 9	2286	55 25 48	2282	53 39 22	2279	51 52 51	2276
	Fomalhaut	E.	79 21 48	2439	77 39 8	2437	75 56 26	2436	74 13 42	2435
7	Spica	W.	66 2 44	2264	67 49 36	2262	69 36 31	2260	71 23 29	2259
	Jupiter	E.	42 59 22	2267	41 12 34	2267	39 25 47	2268	37 38 59	2269
	Fomalhaut	E.	65 40 29	2449	63 58 4	2454	62 15 47	2461	60 33 40	2469
	α Pegasi	E.	84 5 4	2648	82 27 15	2651	80 49 30	2655	79 11 50	2659
8	Spica	W.	80 18 31	2259	82 5 30	2260	83 52 28	2261	85 39 23	2263
	Antares	W.	34 30 18	2302	36 16 16	2297	38 2 20	2293	39 48 30	2291
	Jupiter	E.	28 45 46	2284	26 59 23	2290	25 13 9	2297	23 27 5	2304
	Fomalhaut	E.	52 6 28	2530	50 25 57	2547	48 45 49	2566	47 6 8	2589
	α Pegasi	E.	71 5 37	2702	69 29 0	2715	67 52 40	2729	66 16 39	2745
	Sun	E.	125 36 28	2541	123 56 12	2542	122 15 58	2543	120 35 46	2545

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
9	Spica	W.	87° 26′ 16″	2265	89° 13′ 5″	2267	90° 59′ 50″	2270	92° 46′ 32″	2274
	Antares	W.	41 34 43	2289	43 20 59	2289	45 7 15	2288	46 53 32	2288
	Mars	W.	38 13 37	2184	40 2 29	2184	41 51 20	2186	43 40 8	2189
	Fomalhaut	E.	45 26 58	2614	43 48 22	2642	42 10 24	2673	40 33 8	2707
	α Pegasi	E.	64 40 59	2762	63 5 42	2782	61 30 51	2804	59 56 28	2827
	Sun	E.	118 55 36	2547	117 15 29	2549	115 35 26	2552	113 55 26	2555
10	Spica	W.	101 38 45	2292	103 24 54	2297	105 10 56	2302	106 56 51	2306
	Antares	W.	55 44 35	2297	57 30 39	2299	59 16 39	2302	61 2 35	2307
	Mars	W.	52 43 7	2203	54 31 29	2207	56 19 46	2211	58 7 57	2215
	α Pegasi	E.	52 13 17	2986	50 42 47	3029	49 13 11	3075	47 44 31	3127
	Sun	E.	105 36 31	2573	103 57 0	2577	102 17 34	2582	100 38 15	2587
11	Antares	W.	69 50 48	2326	71 36 8	2331	73 21 22	2336	75 6 28	2341
	Mars	W.	67 7 22	2236	68 54 55	2241	70 42 21	2246	72 29 40	2251
	α Aquilæ	W.	37 44 52	5274	38 38 18	5042	39 34 40	4839	40 33 44	4660
	Sun	E.	92 23 18	2612	90 44 40	2617	89 6 9	2623	87 27 46	2629
12	Antares	W.	83 50 7	2368	85 34 27	2374	87 18 38	2380	89 2 40	2386
	Mars	W.	81 24 23	2277	83 10 56	2282	84 57 21	2287	86 43 38	2293
	α Aquilæ	W.	46 2 27	4098	47 13 39	3939	48 26 19	3860	49 40 19	3789
	Jupiter	W.	21 12 1	2414	22 55 16	2413	24 38 32	2414	26 21 45	2415
	Sun	E.	79 17 52	2659	77 40 18	2665	76 2 52	2672	74 25 36	2679
13	Antares	W.	97 40 39	2419	99 23 48	2426	101 6 46	2433	102 49 35	2440
	α Aquilæ	W.	56 6 32	3530	57 26 23	3494	58 46 54	3460	60 8 2	3431
	Jupiter	W.	34 57 1	2433	36 39 48	2438	38 22 30	2443	40 5 3	2448
	Sun	E.	66 21 27	2713	64 45 4	2720	63 8 51	2727	61 32 48	2734
14	α Aquilæ	W.	67 0 51	3328	68 24 30	3315	69 48 24	3303	71 12 32	3293
	Jupiter	W.	48 35 52	2477	50 17 36	2484	51 59 12	2491	53 40 38	2498
	Sun	E.	53 34 57	2772	51 59 53	2780	50 25 0	2788	48 50 16	2797
15	α Aquilæ	W.	78 15 19	3270	79 40 5	3269	81 4 52	3271	82 29 37	3273
	Jupiter	W.	62 5 24	2533	63 45 52	2540	65 26 9	2547	67 6 15	2554
	Sun	E.	40 59 21	2838	39 25 44	2847	37 52 17	2856	36 19 3	2866
16	α Aquilæ	W.	89 32 16	3303	90 56 24	3311	92 20 22	3322	93 44 8	3334
	Jupiter	W.	75 24 6	2595	77 3 7	2603	78 41 56	2612	80 20 33	2621
	Sun	E.	28 35 56	2916	27 3 58	2927	25 32 14	2938	24 0 44	2950
20	Sun	W.	19 7 47	3260	20 32 45	3266	21 57 36	3274	23 22 19	3281
	Regulus	E.	69 48 12	2893	68 15 44	2903	66 43 29	2913	65 11 25	2922
21	Sun	W.	30 23 37	3320	31 47 25	3328	33 11 3	3336	34 34 33	3343
	Regulus	E.	57 34 9	2968	56 3 17	2976	54 32 36	2985	53 2 6	2994
	Spica	E.	111 35 27	2985	110 4 56	2992	108 34 34	3000	107 4 21	3007
22	Sun	W.	41 29 51	3380	42 52 30	3386	44 15 2	3392	45 37 27	3398
	Saturn	E.	44 43 14	3039	43 13 50	3046	41 44 35	3053	40 15 28	3060
	Regulus	E.	45 32 13	3036	44 2 44	3044	42 33 25	3052	41 4 16	3059
	Spica	E.	99 35 30	3041	98 6 9	3047	96 36 55	3053	95 7 48	3059

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
9	Spica	W.	94° 33′ 9″	2277	96° 19′ 41″	2280	98° 6′ 8″	2284	99° 52′ 30″	2288
	Antares	W.	48 39 49	2289	50 26 4	2291	52 12 17	2293	53 58 28	2295
	Mars	W.	45 28 52	2191	47 17 32	2194	49 6 8	2197	50 54 39	2200
	Fomalhaut	E.	38 56 40	2749	37 21 5	2795	35 46 31	2848	34 13 6	2910
	α Pegasi	E.	58 22 36	2854	56 49 18	2882	55 16 36	2914	53 44 35	2948
	Sun	E.	112 15 29	2558	110 35 37	2561	108 55 50	2565	107 16 8	2569
10	Spica	W.	108 42 38	2313	110 28 18	2319	112 13 50	2325	113 59 14	2331
	Antares	W.	62 48 24	2310	64 34 9	2314	66 19 48	2318	68 5 21	2322
	Mars	W.	59 56 2	2219	61 44 2	2223	63 31 55	2227	65 19 41	2231
	α Pegasi	E.	46 16 54	3184	44 50 25	3249	43 25 12	3317	42 1 20	3396
	Sun	E.	98 59 2	2592	97 19 55	2597	95 40 56	2602	94 2 3	2607
11	Antares	W.	76 51 27	2346	78 36 19	2352	80 21 3	2357	82 5 39	2363
	Mars	W.	74 16 52	2256	76 3 56	2261	77 50 53	2267	79 37 42	2272
	α Aquilæ	W.	41 35 17	4503	42 39 6	4363	43 45 1	4237	44 52 52	4127
	Sun	E.	85 49 31	2635	84 11 24	2641	82 33 25	2647	80 55 34	2654
12	Antares	W.	90 46 34	2392	92 30 19	2398	94 13 55	2405	95 57 22	2412
	Mars	W.	88 29 47	2299	90 15 47	2305	92 1 39	2311	93 47 22	2317
	α Aquilæ	W.	50 55 32	3724	52 11 53	3667	53 29 12	3617	54 47 27	3572
	Jupiter	W.	28 4 56	2417	29 48 4	2420	31 31 9	2424	33 14 8	2429
	Sun	E.	72 48 28	2685	71 11 29	2691	69 34 39	2698	67 57 58	2706
13	Antares	W.	104 32 13	2447	106 14 42	2454	107 57 0	2461	109 39 8	2469
	α Aquilæ	W.	61 29 43	3406	62 51 53	3382	64 14 30	3362	65 37 30	3343
	Jupiter	W.	41 47 29	2452	43 29 47	2458	45 11 57	2465	46 53 59	2471
	Sun	E.	59 56 54	2741	58 21 10	2748	56 45 36	2756	55 10 12	2764
14	α Aquilæ	W.	72 36 51	3286	74 1 19	3280	75 25 53	3274	76 50 35	3272
	Jupiter	W.	55 21 54	2505	57 3 2	2512	58 43 59	2519	60 24 47	2526
	Sun	E.	47 15 44	2805	45 41 22	2813	44 7 10	2821	42 33 10	2830
15	α Aquilæ	W.	83 54 20	3277	85 18 58	3282	86 43 32	3287	88 7 58	3294
	Jupiter	W.	68 46 11	2561	70 25 57	2569	72 5 31	2578	73 44 54	2587
	Sun	E.	34 46 1	2876	33 13 10	2886	31 40 33	2895	30 8 8	2905
16	α Aquilæ	W.	95 7 40	3347	96 30 57	3360	97 53 59	3376	99 16 43	3394
	Jupiter	W.	81 59 0	2630	83 37 14	2639	85 15 17	2648	86 53 7	2657
	Sun	E.	22 29 29	2963	20 58 30	2976	19 27 47	2992	17 57 23	3008
20	Sun	W.	24 46 53	3288	26 11 18	3295	27 35 34	3304	28 59 40	3312
	Regulus	E.	63 39 34	2932	62 7 55	2941	60 36 28	2950	59 5 13	2959
21	Sun	W.	35 57 54	3351	37 21 5	3359	38 44 9	3366	40 7 4	3373
	Regulus	E.	51 31 46	3003	50 1 38	3012	48 31 39	3020	47 1 51	3028
	Spica	E.	105 34 17	3014	104 4 23	3021	102 34 37	3028	101 4 59	3035
22	Sun	W.	46 59 45	3403	48 21 57	3408	49 44 3	3414	51 6 4	3420
	Saturn	E.	38 46 30	3066	37 17 39	3073	35 48 57	3079	34 20 22	3086
	Regulus	E.	39 35 16	3067	38 6 24	3074	36 37 42	3081	35 9 8	3088
	Spica	E.	93 38 49	3054	92 9 55	3069	90 41 9	3074	89 12 29	3078

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^{h}.	P. L. of Diff.	VI^{h}.	P. L. of Diff.	IX^{h}.	P. L. of Diff.
23	Sun	W.	52° 27′ 58″	3424	53° 49′ 48″	3427	55° 11′ 34″	3430	56° 33′ 16″	3433
	Saturn	E.	32 51 55	3091	31 23 36	3097	29 55 23	3103	28 27 17	3109
	Regulus	E.	33 40 44	3096	32 12 28	3103	30 44 21	3110	29 16 23	3117
	Spica	E.	87 43 53	3083	86 15 23	3087	84 46 57	3091	83 18 36	3094
24	Sun	W.	63 21 5	3442	64 42 33	3443	66 4 2	3442	67 25 30	3441
	Spica	E.	75 57 39	3104	74 29 34	3105	73 1 31	3106	71 33 27	3106
	Antares	E.	121 51 59	3104	120 23 55	3104	118 55 51	3103	117 27 46	3103
25	Sun	W.	74 13 12	3433	75 34 52	3430	76 56 36	3425	78 18 24	3420
	Pollux	W.	26 38 43	3120	28 6 28	3113	29 34 22	3104	31 2 27	3095
	Spica	E.	64 13 9	3101	62 45 0	3099	61 16 50	3097	59 48 36	3094
	Mars	E.	108 51 57	2952	107 20 44	2948	105 49 26	2945	104 18 4	2941
	Antares	E.	110 6 48	3091	108 38 27	3087	107 10 2	3083	105 41 31	3079
26	Sun	W.	85 8 55	3390	86 31 23	3381	87 54 0	3373	89 16 45	3365
	Pollux	W.	38 25 18	3055	39 54 22	3047	41 23 36	3038	42 53 2	3029
	Spica	E.	52 26 26	3075	50 57 45	3070	49 28 58	3065	48 0 5	3059
	Mars	E.	96 39 45	2914	95 7 44	2907	93 35 34	2900	92 3 15	2892
	Antares	E.	98 17 29	3050	96 48 18	3043	95 18 58	3035	93 49 30	3027
27	Sun	W.	96 13 13	3316	97 37 6	3305	99 1 12	3293	100 25 33	3280
	Pollux	W.	50 23 10	2978	51 53 51	2967	53 24 46	2955	54 55 56	2942
	Spica	E.	40 33 58	3031	39 4 24	3025	37 34 43	3020	36 4 55	3015
	Mars	E.	84 19 1	2848	82 45 34	2838	81 11 55	2827	79 38 1	2816
	Antares	E.	86 19 28	2981	84 48 53	2971	83 18 5	2960	81 47 3	2949
28	Sun	W.	107 31 2	3213	108 56 58	3198	110 23 9	3183	111 49 40	3166
	Pollux	W.	62 35 41	2878	64 8 29	2864	65 41 35	2849	67 14 59	2834
	Saturn	W.	27 3 38	2909	28 35 45	2893	30 8 12	2877	31 41 0	2861
	Regulus	W.	26 44 55	2920	28 16 48	2900	29 49 6	2882	31 21 47	2865
	Mars	E.	71 44 53	2756	70 9 26	2743	68 33 43	2730	66 57 42	2715
	Antares	E.	74 8 13	2888	72 35 39	2875	71 2 49	2862	69 29 41	2848
29	Sun	W.	119 7 1	3085	120 35 30	3067	122 4 20	3050	123 33 31	3032
	Pollux	W.	75 6 51	2757	76 42 15	2741	78 18 0	2725	79 54 6	2708
	Saturn	W.	39 30 19	2777	41 5 16	2760	42 40 35	2743	44 16 16	2727
	Regulus	W.	39 11 3	2774	40 46 4	2756	42 21 29	2738	43 57 17	2721
	Antares	E.	61 39 29	2777	60 4 30	2762	58 29 11	2747	56 53 32	2731
	α Aquilæ	E.	107 9 57	3554	105 50 33	3525	104 30 37	3497	103 10 10	3471
30	Pollux	W.	88 0 13	2625	89 38 34	2608	91 17 20	2591	92 56 28	2573
	Saturn	W.	52 20 26	2639	53 58 26	2622	55 36 50	2605	57 15 38	2588
	Regulus	W.	52 2 15	2631	53 40 27	2613	55 19 3	2595	56 58 3	2578
	Antares	E.	48 50 16	2656	47 12 37	2640	45 34 37	2626	43 56 18	2612
	α Aquilæ	E.	96 20 50	3353	94 57 40	3331	93 34 5	3312	92 10 8	3293
31	Pollux	W.	101 18 5	2488	102 59 35	2471	104 41 29	2455	106 23 45	2438
	Saturn	W.	65 35 36	2501	67 16 48	2484	68 58 24	2467	70 40 23	2450
	Regulus	W.	65 19 12	2490	67 0 39	2473	68 42 30	2456	70 24 45	2439
	Antares	E.	35 40 2	2550	33 59 57	2539	32 19 38	2530	30 39 6	2523
	α Aquilæ	E.	85 5 16	3216	83 39 26	3205	82 13 23	3194	80 47 5	3184

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
23	**Sun**	W.	57° 54′ 55″	3435	59° 16′ 30″	3437	60° 38′ 3″	3439	61° 59′ 35″	3441
	Saturn	E.	26 59 19	3115	25 31 27	3121	24 3 43	3126	22 36 8	3131
	Regulus	E.	27 48 34	3125	26 20 55	3134	24 53 27	3146	23 26 9	3164
	Spica	E.	81 50 19	3097	80 22 4	3099	78 53 54	3101	77 25 45	3103
24	**Sun**	W.	68 46 59	3440	70 8 29	3438	71 30 1	3437	72 51 35	3435
	Spica	E.	70 5 25	3106	68 37 23	3105	67 9 19	3104	65 41 15	3103
	Antares	E.	115 59 40	3102	114 31 30	3100	113 3 19	3097	111 35 5	3094
25	**Sun**	W.	79 40 18	3416	81 2 17	3412	82 24 23	3405	83 46 36	3398
	Pollux	W.	32 30 43	3089	33 59 6	3082	35 27 40	3073	36 56 24	3063
	Spica	E.	58 20 19	3091	56 51 57	3087	55 23 32	3083	53 55 1	3079
	Mars	E.	102 46 37	2936	101 15 4	2931	99 43 25	2926	98 11 39	2920
	Antares	E.	104 12 56	3075	102 44 14	3070	101 15 26	3064	99 46 31	3057
26	**Sun**	W.	90 39 41	3358	92 2 47	3349	93 26 4	3337	94 49 32	3326
	Pollux	W.	44 22 39	3020	45 52 28	3010	47 22 29	2999	48 52 43	2988
	Spica	E.	46 31 5	3054	45 1 59	3049	43 32 45	3043	42 3 26	3037
	Mars	E.	90 30 46	2884	88 58 6	2876	87 25 16	2867	85 52 14	2858
	Antares	E.	92 19 51	3019	90 50 3	3010	89 20 3	3001	87 49 52	2991
27	**Sun**	W.	101 50 8	3267	103 14 57	3253	104 40 3	3240	106 5 24	3226
	Pollux	W.	56 27 21	2930	57 59 1	2917	59 30 58	2904	61 3 11	2891
	Spica	E.	34 35 1	3010	33 5 0	3006	31 34 55	3004	30 4 47	3003
	Mars	E.	78 3 54	2805	76 29 31	2793	74 54 55	2781	73 20 2	2768
	Antares	E.	80 15 47	2938	78 44 17	2926	77 12 31	2914	75 40 30	2901
28	**Sun**	W.	113 16 29	3151	114 43 37	3134	116 11 5	3118	117 38 53	3101
	Pollux	W.	68 48 42	2819	70 22 44	2804	71 57 6	2789	73 31 48	2773
	Saturn	W.	33 14 9	2844	34 47 39	2827	36 21 31	2810	37 55 44	2794
	Regulus	W.	32 54 51	2846	34 28 19	2828	36 2 11	2810	37 36 25	2792
	Mars	E.	65 21 23	2701	63 44 45	2687	62 7 49	2673	60 30 33	2658
	Antares	E.	67 56 16	2834	66 22 32	2820	64 48 30	2806	63 14 9	2791
29	**Sun**	W.	125 3 4	3014	126 32 59	2996	128 3 17	2978	129 33 57	2959
	Pollux	W.	81 30 35	2692	83 7 25	2675	84 44 38	2659	86 22 14	2641
	Saturn	W.	45 52 20	2709	47 28 47	2691	49 5 36	2674	50 42 49	2657
	Regulus	W.	45 33 29	2703	47 10 4	2685	48 47 4	2667	50 24 27	2649
	Antares	E.	55 17 34	2716	53 41 15	2701	52 4 34	2686	50 27 35	2671
	α Aquilæ	E.	101 49 14	3446	100 27 48	3420	99 5 56	3397	97 43 36	3374
30	**Pollux**	W.	94 36 0	2557	96 15 56	2539	97 56 15	2522	99 36 59	2505
	Saturn	W.	58 54 49	2570	60 34 25	2553	62 14 25	2536	63 54 49	2519
	Regulus	W.	58 37 28	2560	60 17 17	2542	61 57 31	2524	63 38 9	2507
	Antares	E.	42 17 39	2598	40 38 42	2584	38 59 26	2572	37 19 52	2560
	α Aquilæ	E.	90 45 48	3275	89 21 8	3259	87 56 9	3243	86 30 51	3229
31	**Pollux**	W.	108 6 25	2422	109 49 28	2406	111 32 54	2391	113 16 42	2375
	Saturn	W.	72 22 46	2434	74 5 32	2418	75 48 42	2402	77 32 14	2386
	Regulus	W.	72 7 24	2422	73 50 26	2406	75 33 52	2390	77 17 41	2374
	Antares	E.	28 58 23	2519	27 17 36	2517	25 36 47	2515	23 55 55	2514
	α Aquilæ	E.	79 20 37	3176	77 54 0	3170	76 27 15	3166	75 0 25	3163

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
SUN.	1	4 37 14.62	10.230	N.22 5 27.6	+20.19	15 48.34	68.43	2 25.93	0.373
Mon.	2	4 41 20.34	10.246	22 13 20.6	19.22	15 48.21	68.48	2 16.79	0.389
Tues.	3	4 45 26.44	10.262	22 20 50.4	18.25	15 48.08	68.53	2 7.27	0.405
Wed.	4	4 49 32.91	10.277	22 27 56.7	+17.27	15 47.95	68.58	1 57.38	0.420
Thur.	5	4 53 39.73	10.291	22 34 39.5	16.29	15 47.83	68.63	1 47.15	0.434
Frid.	6	4 57 46.89	10.305	22 40 58.7	15.30	15 47.71	68.67	1 36.58	0.448
Sat.	7	5 1 54.38	10.318	22 46 54.1	+14.31	15 47.59	68.71	1 25.68	0.461
SUN.	8	5 6 2.17	10.330	22 52 25.5	13.31	15 47.48	68.75	1 14.48	0.473
Mon.	9	5 10 10.25	10.342	22 57 33.0	12.31	15 47.37	68.79	1 3.00	0.485
Tues.	10	5 14 18.59	10.353	23 2 16.3	+11.30	15 47.26	68.82	0 51.24	0.496
Wed.	11	5 18 27.19	10.363	23 6 35.4	10.29	15 47.16	68.85	0 39.23	0.506
Thur.	12	5 22 36.01	10.372	23 10 30.1	9.27	15 47.06	68.88	0 27.01	0.515
Frid.	13	5 26 45.03	10.380	23 14 0.3	+ 8.25	15 46.97	68.90	0 14.58	0.523
Sat.	14	5 30 54.23	10.386	23 17 6.0	7.23	15 46.88	68.92	0 1.97	0.529
SUN.	15	5 35 3.57	10.392	23 19 47.0	6.20	15 46.80	68.94	0 10.78	0.535
Mon.	16	5 39 13.04	10.396	23 22 3.4	+ 5.17	15 46.72	68.95	0 23.65	0.539
Tues.	17	5 43 22.61	10.399	23 23 55.1	4.14	15 46.65	68.96	0 36.63	0.542
Wed.	18	5 47 32.24	10.401	23 25 22.0	3.10	15 46.58	68.97	0 49.66	0.544
Thur.	19	5 51 41.91	10.403	23 26 24.1	+ 2.07	15 46.52	68.97	1 2.74	0.546
Frid.	20	5 55 51.60	10.403	23 27 1.3	+ 1.04	15 46.47	68.97	1 15.84	0.546
Sat.	21	6 0 1.27	10.402	23 27 13.7	0.00	15 46.42	68.97	1 28.91	0.545
SUN.	22	6 4 10.90	10.399	23 27 1.2	− 1.03	15 46.38	68.97	1 41.95	0.542
Mon.	23	6 8 20.47	10.396	23 26 23.9	2.07	15 46.34	68.96	1 54.93	0.539
Tues.	24	6 12 29.95	10.391	23 25 21.8	3.10	15 46.31	68.95	2 7.81	0.534
Wed.	25	6 16 39.30	10.386	23 23 54.9	− 4.13	15 46.28	68.94	2 20.57	0.529
Thur.	26	6 20 48.51	10.379	23 22 3.3	5.16	15 46.25	68.92	2 33.19	0.522
Frid.	27	6 24 57.56	10.372	23 19 47.1	6.19	15 46.23	68.90	2 45.64	0.515
Sat.	28	6 29 6.42	10.364	23 17 6.3	− 7.21	15 46.21	68.88	2 57.91	0.507
SUN.	29	6 33 15.08	10.355	23 14 0.9	8.23	15 46.20	68.85	3 9.98	0.498
Mon.	30	6 37 23.51	10.345	23 10 31.1	9.24	15 46.19	68.82	3 21.82	0.488
Tues.	31	6 41 31.70	10.335	N.23 6 37.0	−10.25	15 46.18	68.78	3 33.42	0.478

Note.—The mean time of semidiameter passing may be found by subtracting 0ˢ.19 from the sidereal time. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign − indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to / Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
SUN.	1	4 37 15.04	10.229	N. 22 5 28.4	+20.19	2 25.92	0.373	4 39 40.96
Mon.	2	4 41 20.74	10.245	22 13 21.3	19.22	2 16.78	0.389	4 43 37.51
Tues.	3	4 45 26.81	10.261	22 20 51.0	18.25	2 7.26	0.405	4 47 34.07
Wed.	4	4 49 33.25	10.276	22 27 57.3	+17.27	1 57.37	0.420	4 51 30.62
Thur.	5	4 53 40.04	10.290	22 34 40.0	16.29	1 47.14	0.434	4 55 27.18
Frid.	6	4 57 47.17	10.304	22 40 59.1	15.30	1 36.57	0.448	4 59 23.74
Sat.	7	5 1 54.63	10.317	22 46 54.4	+14.31	1 25.67	0.461	5 3 20.30
SUN.	8	5 6 2.39	10.329	22 52 25.8	13.31	1 14.47	0.473	5 7 16.86
Mon.	9	5 10 10.43	10.341	22 57 33.2	12.31	1 2.99	0.485	5 11 13.42
Tues.	10	5 14 18.74	10.352	23 2 16.5	+11.30	0 51.23	0.496	5 15 9.97
Wed.	11	5 18 27.30	10.362	23 6 35.5	10.29	0 39.22	0.506	5 19 6.53
Thur.	12	5 22 36.09	10.371	23 10 30.1	9.27	0 27.00	0.515	5 23 3.09
Frid.	13	5 26 45.07	10.379	23 14 0.3	+ 8.25	0 14.58	0.523	5 26 59.65
Sat.	14	5 30 54.23	10.385	23 17 6.0	7.23	0 1.97	0.529	5 30 56.20
SUN.	15	5 35 3.54	10.391	23 19 47.0	6.20	0 10.78	0.535	5 34 52.76
Mon.	16	5 39 12.97	10.395	23 22 3.4	+ 5.17	0 23.65	0.539	5 38 49.32
Tues.	17	5 43 22.50	10.398	23 23 55.1	4.14	0 36.62	0.542	5 42 45.88
Wed.	18	5 47 32.09	10.400	23 25 22.0	3.10	0 49.65	0.544	5 46 42.44
Thur.	19	5 51 41.73	10.402	23 26 24.1	+ 2.07	1 2.73	0.546	5 50 39.00
Frid.	20	5 55 51.38	10.402	23 27 1.3	+ 1.04	1 15.83	0.546	5 54 35.55
Sat.	21	6 0 1.01	10.401	23 27 13.7	0.00	1 28.90	0.545	5 58 32.11
SUN.	22	6 4 10.61	10.398	23 27 1.3	− 1.03	1 41.94	0.542	6 2 28.67
Mon.	23	6 8 20.15	10.395	23 26 24.0	2.07	1 54.92	0.539	6 6 25.23
Tues.	24	6 12 29.58	10.390	23 25 21.9	3.10	2 7.80	0.534	6 10 21.78
Wed.	25	6 16 38.89	10.385	23 23 55.1	− 4.13	2 20.55	0.529	6 14 18.34
Thur.	26	6 20 48.07	10.378	23 22 3.6	5.16	2 33.17	0.522	6 18 14.90
Frid.	27	6 24 57.08	10.371	23 19 47.4	6.19	2 45.62	0.515	6 22 11.46
Sat.	28	6 29 5.91	10.363	23 17 6.6	− 7.21	2 57.89	0.507	6 26 8.02
SUN.	29	6 33 14.53	10.354	23 14 1.3	8.23	3 9.95	0.498	6 30 4.58
Mon.	30	6 37 22.92	10.344	23 10 31.6	9.24	3 21.79	0.488	6 34 1.13
Tues.	31	6 41 31.08	10.334	N. 23 6 37.6	−10.25	3 33.39	0.478	6 37 57.69

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign — indicates that north declinations are decreasing.

Diff. for 1 hour, + 9ˢ.8565. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	152	70 53 55.1	53 52.1	143.60	+ 0.44	0.0062099	+25.4	19 17 8.96
2	153	71 51 21.0	51 17.8	143.55	0.32	0.0062703	24.9	19 13 13.05
3	154	72 48 45.8	48 42.5	143.51	0.19	0.0063295	24.4	19 9 17.14
4	155	73 46 9.7	46 6.3	143.48	+ 0.06	0.0063874	+23.9	19 5 21.22
5	156	74 43 32.9	43 29.3	143.45	− 0.07	0.0064441	23.3	19 1 25.31
6	157	75 40 55.4	40 51.6	143.42	0.19	0.0064994	22.8	18 57 29.40
7	158	76 38 17.2	38 13.2	143.40	− 0.29	0.0065533	+22.2	18 53 33.49
8	159	77 35 38.4	35 34.2	143.37	0.37	0.0066057	21.5	18 49 37.57
9	160	78 32 59.2	32 54.8	143.35	0.42	0.0066564	20.8	18 45 41.66
10	161	79 30 19.5	30 15.0	143.33	− 0.44	0.0067053	+20.0	18 41 45.75
11	162	80 27 39.4	27 34.7	143.31	0.42	0.0067522	19.2	18 37 49.84
12	163	81 24 58.9	24 54.0	143.29	0.38	0.0067971	18.3	18 33 53.92
13	164	82 22 17.9	22 12.8	143.28	− 0.31	0.0068398	+17.3	18 29 58.01
14	165	83 19 36.5	19 31.2	143.26	0.22	0.0068801	16.3	18 26 2.10
15	166	84 16 54.7	16 49.3	143.25	− 0.12	0.0069180	15.3	18 22 6.19
16	167	85 14 12.5	14 6.9	143.23	+ 0.01	0.0069533	+14.2	18 18 10.27
17	168	86 11 29.8	11 24.0	143.21	0.14	0.0069861	13.1	18 14 14.36
18	169	87 8 46.7	8 40.7	143.19	0.27	0.0070163	12.0	18 10 18.45
19	170	88 6 3.1	5 56.9	143.17	+ 0.39	0.0070439	+10.9	18 6 22.54
20	171	89 3 18.9	3 12.6	143.15	0.50	0.0070689	9.9	18 2 26.63
21	172	90 0 34.1	0 27.7	143.13	0.59	0.0070914	8.9	17 58 30.72
22	173	90 57 48.8	57 42.2	143.10	+ 0.65	0.0071115	+ 7.9	17 54 34.81
23	174	91 55 3.0	54 56.1	143.08	0.68	0.0071292	6.9	17 50 38.90
24	175	92 52 16.5	52 9.4	143.05	0.68	0.0071447	6.0	17 46 42.98
25	176	93 49 29.4	49 22.2	143.03	+ 0.66	0.0071582	+ 5.2	17 42 47.07
26	177	94 46 41.9	46 34.5	143.01	0.60	0.0071698	4.4	17 38 51.16
27	178	95 43 53.9	43 46.3	142.99	0.51	0.0071794	3.6	17 34 55.25
28	179	96 41 5.5	40 57.7	142.97	+ 0.41	0.0071872	+ 2.9	17 30 59.33
29	180	97 38 16.7	38 8.7	142.96	0.30	0.0071934	2.3	17 27 3.42
30	181	98 35 27.6	35 19.4	142.95	0.17	0.0071981	1.7	17 23 7.51
31	182	99 32 38.3	32 30.0	142.94	+ 0.03	0.0072014	+ 1.1	17 19 11.60

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January $0^{d}.0$.

Diff. for 1 Hour, — $9^{s}.8296$. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 1.2	16 7.5	58 41.1	+1.98	59 4.1	+1.84	10 46.3	2.24	13.7
2	16 13.2	16 18.2	59 25.1	1.65	59 43.6	1.42	11 42.3	2.42	14.7
3	16 22.5	16 25.8	59 59.2	1.16	60 11.4	0.87	12 42.5	2.57	15.7
4	16 28.2	16 29.5	60 20.1	+0.57	60 25.1	+0.26	13 45.6	2.64	16.7
5	16 29.8	16 29.2	60 26.3	−0.04	60 24.0	−0.33	14 49.2	2.61	17.7
6	16 27.7	16 25.4	60 18.4	0.59	60 9.8	0.83	15 50.7	2.48	18.7
7	16 22.3	16 18.6	59 58.5	−1.03	59 45.0	−1.20	16 48.4	2.32	19.7
8	16 14.4	16 9.9	59 29.7	1.33	59 13.0	1.43	17 42.0	2.18	20.7
9	16 5.1	16 0.1	58 55.3	1.50	58 37.1	1.53	18 32.0	2.03	21.7
10	15 55.1	15 50.0	58 18.6	−1.55	58 0.0	−1.54	19 19.5	1.93	22.7
11	15 45.0	15 40.1	57 41.6	1.52	57 23.5	1.49	20 5.6	1.91	23.7
12	15 35.3	15 30.6	57 5.8	1.45	56 48.7	1.41	20 51.4	1.92	24.7
13	15 26.1	15 21.8	56 32.1	−1.36	56 16.2	−1.30	21 37.8	1.96	25.7
14	15 17.6	15 13.6	56 0.9	1.25	55 46.3	1.19	22 25.5	2.02	26.7
15	15 9.8	15 6.2	55 32.4	1.13	55 19.1	1.07	23 14.6	2.07	27.7
16	15 2.8	14 59.6	55 6.6	−1.00	54 55.0	−0.93	δ		28.7
17	14 56.7	14 54.0	54 44.2	0.86	54 34.4	0.77	0 4.9	2.10	0.1
18	14 51.7	14 49.6	54 25.7	0.68	54 18.1	0.58	0 55.6	2.10	1.1
19	14 47.9	14 46.6	54 11.8	−0.46	54 7.0	−0.34	1 45.9	2.07	2.1
20	14 45.7	14 45.3	54 3.7	−0.20	54 2.2	−0.05	2 34.9	2.00	3.1
21	14 45.4	14 46.0	54 2.6	+0.11	54 4.9	+0.28	3 22.0	1.92	4.1
22	14 47.2	14 49.1	54 9.4	+0.47	54 16.1	+0.66	4 7.2	1.85	5.1
23	14 51.5	14 54.6	54 25.1	0.85	54 36.5	1.05	4 50.7	1.79	6.1
24	14 58.4	15 2.8	54 50.3	1.25	55 6.5	1.45	5 33.1	1.77	7.1
25	15 7.8	15 13.5	55 25.0	+1.64	55 45.8	+1.82	6 15.5	1.78	8.1
26	15 19.7	15 26.4	56 8.6	1.98	56 33.3	2.12	6 58.7	1.84	9.1
27	15 33.6	15 41.0	56 59.6	2.24	57 27.0	2.32	7 44.0	1.95	10.1
28	15 48.7	15 56.5	57 55.2	+2.36	58 23.7	+2.36	8 32.5	2.11	11.1
29	16 4.1	16 11.5	58 51.8	2.30	59 18.8	2.19	9 25.5	2.31	12.1
30	16 18.4	16 24.6	59 44.2	2.02	60 7.2	1.80	10 23.4	2.50	13.1
31	16 30.1	16 34.6	60 27.3	+1.52	60 43.7	+1.20	11 25.7	2.65	14.1

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 1.					**TUESDAY 3.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	15 3 8.55	2.2477	S. 14 0 2.3	12.148	0	16 58 58.57	2.5739	S. 21 58 26.4	7.114
1	15 5 23.61	2.2543	14 12 9.3	12.084	1	17 1 33.18	2.5798	22 5 28.9	6.967
2	15 7 39.07	2.2610	14 24 12.4	12.017	2	17 4 8.14	2.5856	22 12 22.5	6.819
3	15 9 54.93	2.2677	14 36 11.4	11.949	3	17 6 43.45	2.5913	22 19 7.2	6.670
4	15 12 11.19	2.2744	14 48 6.3	11.881	4	17 9 19.10	2.5970	22 25 42.9	6.519
5	15 14 27.86	2.2812	14 59 57.1	11.811	5	17 11 55.09	2.6026	22 32 9.5	6.367
6	15 16 44.94	2.2881	15 11 43.6	11.738	6	17 14 31.41	2.6080	22 38 26.9	6.213
7	15 19 2.43	2.2949	15 23 25.7	11.664	7	17 17 8.05	2.6132	22 44 35.1	6.057
8	15 21 20.33	2.3018	15 35 3.3	11.588	8	17 19 45.00	2.6184	22 50 33.8	5.899
9	15 23 38.65	2.3087	15 46 36.3	11.511	9	17 22 22.26	2.6235	22 56 23.0	5.741
10	15 25 57.38	2.3157	15 58 4.6	11.432	10	17 24 59.82	2.6285	23 2 2.7	5.582
11	15 28 16.53	2.3226	16 9 28.1	11.351	11	17 27 37.68	2.6333	23 7 32.9	5.422
12	15 30 36.09	2.3295	16 20 46.7	11.268	12	17 30 15.82	2.6380	23 12 53.4	5.261
13	15 32 56.07	2.3366	16 32 0.3	11.183	13	17 32 54.24	2.6427	23 18 4.2	5.097
14	15 35 16.48	2.3437	16 43 8.7	11.097	14	17 35 32.94	2.6472	23 23 5.1	4.932
15	15 37 37.31	2.3507	16 54 11.9	11.008	15	17 38 11.91	2.6516	23 27 56.1	4.767
16	15 39 58.56	2.3577	17 5 9.7	10.918	16	17 40 51.13	2.6558	23 32 37.2	4.601
17	15 42 20.23	2.3647	17 16 2.1	10.827	17	17 43 30.60	2.6599	23 37 8.2	4.433
18	15 44 42.33	2.3718	17 26 49.0	10.734	18	17 46 10.32	2.6639	23 41 29.1	4.264
19	15 47 4.85	2.3789	17 37 30.2	10.639	19	17 48 50.27	2.6677	23 45 39.9	4.095
20	15 49 27.80	2.3860	17 48 5.6	10.542	20	17 51 30.44	2.6712	23 49 40.5	3.924
21	15 51 51.17	2.3931	17 58 35.2	10.443	21	17 54 10.82	2.6747	23 53 30.8	3.752
22	15 54 14.97	2.4002	18 8 58.8	10.342	22	17 56 51.41	2.6782	23 57 10.7	3.579
23	15 56 39.19	2.4072	S. 18 19 16.3	10.240	23	17 59 32.20	2.6814	S. 24 0 40.3	3.406
	MONDAY 2.					**WEDNESDAY 4.**			
0	15 59 3.83	2.4143	S. 18 29 27.6	10.136	0	18 2 13.18	2.6845	S. 24 3 59.5	3.232
1	16 1 28.89	2.4213	18 39 32.6	10.030	1	18 4 54.34	2.6874	24 7 8.2	3.057
2	16 3 54.38	2.4284	18 49 31.2	9.922	2	18 7 35.67	2.6902	24 10 6.4	2.882
3	16 6 20.30	2.4355	18 59 23.3	9.813	3	18 10 17.16	2.6927	24 12 54.0	2.705
4	16 8 46.64	2.4424	19 9 8.8	9.702	4	18 12 58.80	2.6952	24 15 31.0	2.528
5	16 11 13.39	2.4493	19 18 47.5	9.588	5	18 15 40.58	2.6975	24 17 57.4	2.351
6	16 13 40.56	2.4563	19 28 19.4	9.474	6	18 18 22.50	2.6997	24 20 13.1	2.172
7	16 16 8.15	2.4632	19 37 44.4	9.357	7	18 21 4.54	2.7016	24 22 18.1	1.993
8	16 18 36.15	2.4702	19 47 2.3	9.239	8	18 23 46.69	2.7033	24 24 12.3	1.813
9	16 21 4.57	2.4771	19 56 13.1	9.119	9	18 26 28.94	2.7050	24 25 55.7	1.633
10	16 23 33.40	2.4839	20 5 16.6	8.997	10	18 29 11.29	2.7065	24 27 28.3	1.453
11	16 26 2.64	2.4907	20 14 12.7	8.873	11	18 31 53.72	2.7077	24 28 50.1	1.273
12	16 28 32.28	2.4974	20 23 1.4	8.748	12	18 34 36.22	2.7088	24 30 1.1	1.092
13	16 31 2.33	2.5041	20 31 42.5	8.621	13	18 37 18.78	2.7098	24 31 1.2	0.911
14	16 33 32.78	2.5108	20 40 15.9	8.492	14	18 40 1.40	2.7107	24 31 50.4	0.729
15	16 36 3.63	2.5174	20 48 41.6	8.362	15	18 42 44.06	2.7113	24 32 28.7	0.547
16	16 38 34.87	2.5239	20 56 59.4	8.230	16	18 45 26.75	2.7117	24 32 56.1	0.366
17	16 41 6.50	2.5305	21 5 9.2	8.097	17	18 48 9.46	2.7119	24 33 12.6	0.184
18	16 43 38.53	2.5370	21 13 11.0	7.962	18	18 50 52.18	2.7120	24 33 18.2	− 0.003
19	16 46 10.94	2.5433	21 21 4.6	7.824	19	18 53 34.90	2.7119	24 33 12.9	+ 0.179
20	16 48 43.72	2.5495	21 28 49.9	7.685	20	18 56 17.61	2.7117	24 32 56.7	0.362
21	16 51 16.88	2.5557	21 36 26.8	7.545	21	18 59 0.31	2.7113	24 32 29.5	0.544
22	16 53 50.41	2.5619	21 43 55.3	7.403	22	19 1 42.97	2.7107	24 31 51.4	0.725
23	16 56 24.31	2.5680	21 51 15.2	7.259	23	19 4 25.59	2.7099	24 31 2.5	0.906
24	16 58 58.57	2.5739	S. 21 58 26.4	7.114	24	19 7 8.16	2.7090	S. 24 30 2.7	1.087

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 5.					SATURDAY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	19 7 8.16	2.7090	S.24 30 2.7	1.087	0	21 13 19.94	2.5057	S.20 22 46.4	8.782
1	19 9 50.67	2.7079	24 28 52.0	1.268	1	21 15 50.09	2.4993	20 13 55.6	8.910
2	19 12 33.11	2.7067	24 27 30.5	1.449	2	21 18 19.85	2.4928	20 4 57.2	9.036
3	19 15 15.47	2.7053	24 25 58.1	1.630	3	21 20 49.23	2.4864	19 55 51.3	9.161
4	19 17 57.74	2.7037	24 24 14.9	1.809	4	21 23 18.22	2.4799	19 46 37.9	9.284
5	19 20 39.91	2.7018	24 22 21.0	1.988	5	21 25 46.82	2.4735	19 37 17.2	9.405
6	19 23 21.96	2.6998	24 20 16.3	2.167	6	21 28 15.04	2.4671	19 27 49.3	9.524
7	19 26 3.89	2.6978	24 18 0.9	2.346	7	21 30 42.87	2.4605	19 18 14.3	9.642
8	19 28 45.70	2.6957	24 15 34.8	2.524	8	21 33 10.30	2.4538	19 8 32.3	9.758
9	19 31 27.37	2.6933	24 12 58.0	2.701	9	21 35 37.33	2.4472	18 58 43.4	9.873
10	19 34 8.89	2.6908	24 10 10.6	2.877	10	21 38 3.97	2.4407	18 48 47.6	9.986
11	19 36 50.26	2.6881	24 7 12.7	3.053	11	21 40 30.22	2.4342	18 38 45.1	10.096
12	19 39 31.46	2.6852	24 4 4.2	3.229	12	21 42 56.07	2.4276	18 28 36.1	10.204
13	19 42 12.48	2.6822	24 0 45.2	3.403	13	21 45 21.53	2.4210	18 18 20.6	10.312
14	19 44 53.32	2.6791	23 57 15.8	3.577	14	21 47 46.59	2.4144	18 7 58.6	10.419
15	19 47 33.97	2.6758	23 53 36.0	3.750	15	21 50 11.26	2.4078	17 57 30.3	10.523
16	19 50 14.41	2.6723	23 49 45.8	3.922	16	21 52 35.53	2.4012	17 46 55.8	10.626
17	19 52 54.64	2.6688	23 45 45.3	4.093	17	21 54 59.41	2.3947	17 36 15.2	10.727
18	19 55 34.66	2.6651	23 41 34.6	4.263	18	21 57 22.90	2.3882	17 25 28.6	10.826
19	19 58 14.45	2.6612	23 37 13.7	4.432	19	21 59 46.00	2.3817	17 14 36.1	10.923
20	20 0 54.00	2.6572	23 32 42.7	4.600	20	22 2 8.70	2.3751	17 3 37.8	11.019
21	20 3 33.31	2.6531	23 28 1.7	4.767	21	22 4 31.01	2.3686	16 52 33.8	11.113
22	20 6 12.37	2.6489	23 23 10.7	4.932	22	22 6 52.93	2.3621	16 41 24.2	11.206
23	20 8 51.18	2.6446	S.23 18 9.7	5.096	23	22 9 14.46	2.3557	S.16 30 9.1	11.297
	FRIDAY 6.					SUNDAY 8			
0	20 11 29.72	2.6401	S.23 12 58.9	5.262	0	22 11 35.61	2.3492	S.16 18 48.6	11.386
1	20 14 7.99	2.6355	23 7 38.3	5.424	1	22 13 56.37	2.3428	16 7 22.8	11.473
2	20 16 45.98	2.6307	23 2 8.0	5.586	2	22 16 16.75	2.3365	15 55 51.8	11.559
3	20 19 23.68	2.6259	22 56 28.0	5.746	3	22 18 36.75	2.3301	15 44 15.7	11.643
4	20 22 1.09	2.6211	22 50 38.5	5.904	4	22 20 56.37	2.3238	15 32 34.6	11.726
5	20 24 38.21	2.6161	22 44 39.5	6.062	5	22 23 15.61	2.3176	15 20 48.6	11.807
6	20 27 15.02	2.6109	22 38 31.1	6.218	6	22 25 34.48	2.3113	15 8 57.8	11.886
7	20 29 51.52	2.6057	22 32 13.4	6.373	7	22 27 52.97	2.3051	14 57 2.3	11.963
8	20 32 27.71	2.6005	22 25 46.4	6.527	8	22 30 11.09	2.2989	14 45 2.2	12.039
9	20 35 3.58	2.5951	22 19 10.2	6.679	9	22 32 28.84	2.2928	14 32 57.6	12.113
10	20 37 39.12	2.5896	22 12 24.9	6.830	10	22 34 46.23	2.2868	14 20 48.6	12.187
11	20 40 14.33	2.5840	22 5 30.6	6.979	11	22 37 3.26	2.2808	14 8 35.2	12.259
12	20 42 49.20	2.5784	21 58 27.4	7.127	12	22 39 19.93	2.2748	13 56 17.5	12.329
13	20 45 23.73	2.5727	21 51 15.4	7.273	13	22 41 36.24	2.2688	13 43 55.7	12.397
14	20 47 57.92	2.5669	21 43 54.6	7.418	14	22 43 52.19	2.2629	13 31 29.9	12.463
15	20 50 31.76	2.5610	21 36 25.2	7.562	15	22 46 7.79	2.2572	13 19 0.2	12.528
16	20 53 5.24	2.5550	21 28 47.2	7.703	16	22 48 23.05	2.2515	13 6 26.6	12.591
17	20 55 38.36	2.5491	21 21 0.8	7.843	17	22 50 37.97	2.2457	12 53 49.3	12.652
18	20 58 11.13	2.5430	21 13 6.0	7.982	18	22 52 52.54	2.2400	12 41 8.3	12.713
19	21 0 43.53	2.5369	21 5 2.9	8.120	19	22 55 6.77	2.2344	12 28 23.7	12.772
20	21 3 15.56	2.5307	20 56 51.6	8.256	20	22 57 20.67	2.2289	12 15 35.7	12.828
21	21 5 47.22	2.5245	20 48 32.2	8.390	21	22 59 34.24	2.2234	12 2 44.3	12.884
22	21 8 18.50	2.5182	20 40 4.8	8.522	22	23 1 47.48	2.2180	11 49 49.6	12.939
23	21 10 49.41	2.5120	20 31 29.5	8.653	23	23 4 0.40	2.2126	11 36 51.6	12.992
24	21 13 19.94	2.5057	S.20 22 46.4	8.782	24	23 6 12.99	2.2073	S.11 23 50.5	13.043

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	23 6 12.99	2.2073	S. 11 23 50.5	13.043
1	23 8 25.27	2.2021	11 10 46.4	13.093
2	23 10 37.24	2.1969	10 57 39.4	13.141
3	23 12 48.90	2.1917	10 44 29.5	13.188
4	23 15 0.25	2.1867	10 31 16.8	13.234
5	23 17 11.30	2.1817	10 18 1.4	13.277
6	23 19 22.05	2.1768	10 4 43.5	13.319
7	23 21 32.51	2.1719	9 51 23.1	13.361
8	23 23 42.68	2.1671	9 38 0.2	13.402
9	23 25 52.56	2.1623	9 24 34.9	13.440
10	23 28 2.16	2.1577	9 11 7.4	13.477
11	23 30 11.49	2.1532	8 57 37.7	13.512
12	23 32 20.55	2.1487	8 44 6.0	13.545
13	23 34 29.34	2.1442	8 30 32.3	13.578
14	23 36 37.86	2.1398	8 16 56.6	13.611
15	23 38 46.12	2.1355	8 3 18.9	13.642
16	23 40 54.12	2.1313	7 49 39.5	13.670
17	23 43 1.88	2.1272	7 35 58.5	13.697
18	23 45 9.39	2.1232	7 22 15.9	13.723
19	23 47 16.66	2.1192	7 8 31.7	13.748
20	23 49 23.69	2.1152	6 54 46.1	13.772
21	23 51 30.48	2.1113	6 40 59.1	13.794
22	23 53 37.04	2.1075	6 27 10.8	13.816
23	23 55 43.38	2.1038	S. 6 13 21.2	13.836

TUESDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	23 57 49.50	2.1002	S. 5 59 30.5	13.854
1	23 59 55.41	2.0966	5 45 38.7	13.872
2	0 2 1.10	2.0931	5 31 45.9	13.888
3	0 4 6.58	2.0897	5 17 52.2	13.902
4	0 6 11.86	2.0864	5 3 57.7	13.915
5	0 8 16.95	2.0832	4 50 2.4	13.928
6	0 10 21.84	2.0799	4 36 6.3	13.940
7	0 12 26.54	2.0768	4 22 9.6	13.950
8	0 14 31.06	2.0738	4 8 12.3	13.959
9	0 16 35.40	2.0709	3 54 14.5	13.967
10	0 18 39.57	2.0680	3 40 16.3	13.973
11	0 20 43.56	2.0651	3 26 17.8	13.978
12	0 22 47.38	2.0623	3 12 19.0	13.982
13	0 24 51.04	2.0597	2 58 20.0	13.985
14	0 26 54.55	2.0572	2 44 20.8	13.987
15	0 28 57.91	2.0547	2 30 21.5	13.988
16	0 31 1.12	2.0522	2 16 22.2	13.988
17	0 33 4.18	2.0498	2 2 22.9	13.987
18	0 35 7.10	2.0475	1 48 23.8	13.983
19	0 37 9.88	2.0453	1 34 24.9	13.979
20	0 39 12.54	2.0432	1 20 26.3	13.974
21	0 41 15.07	2.0412	1 6 28.0	13.969
22	0 43 17.48	2.0392	0 52 30.0	13.963
23	0 45 19.77	2.0372	0 38 32.4	13.955
24	0 47 21.95	2.0354	S. 0 24 35.4	13.945

WEDNESDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	0 47 21.95	2.0354	S. 0 24 35.4	13.945
1	0 49 24.02	2.0337	S. 0 10 39.0	13.935
2	0 51 25.99	2.0320	N. 0 3 16.8	13.924
3	0 53 27.86	2.0303	0 17 11.9	13.912
4	0 55 29.63	2.0287	0 31 6.2	13.898
5	0 57 31.30	2.0272	0 44 59.6	13.883
6	0 59 32.89	2.0258	0 58 52.2	13.868
7	1 1 34.40	2.0245	1 12 43.8	13.852
8	1 3 35.83	2.0232	1 26 34.4	13.834
9	1 5 37.19	2.0220	1 40 23.9	13.816
10	1 7 38.47	2.0208	1 54 12.3	13.797
11	1 9 39.69	2.0198	2 7 59.5	13.776
12	1 11 40.85	2.0188	2 21 45.4	13.754
13	1 13 41.95	2.0179	2 35 30.0	13.732
14	1 15 43.00	2.0170	2 49 13.2	13.708
15	1 17 43.99	2.0162	3 2 55.0	13.684
16	1 19 44.94	2.0155	3 16 35.3	13.658
17	1 21 45.85	2.0149	3 30 14.0	13.631
18	1 23 46.73	2.0144	3 43 51.0	13.604
19	1 25 47.58	2.0138	3 57 26.4	13.576
20	1 27 48.39	2.0133	4 11 0.1	13.547
21	1 29 49.17	2.0129	4 24 32.0	13.516
22	1 31 49.93	2.0126	4 38 2.0	13.484
23	1 33 50.68	2.0123	N. 4 51 30.0	13.451

THURSDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	1 35 51.41	2.0121	N. 5 4 56.1	13.418
1	1 37 52.13	2.0120	5 18 20.2	13.384
2	1 39 52.85	2.0120	5 31 42.2	13.349
3	1 41 53.57	2.0119	5 45 2.1	13.313
4	1 43 54.28	2.0119	5 58 19.8	13.276
5	1 45 55.00	2.0121	6 11 35.2	13.238
6	1 47 55.73	2.0123	6 24 48.3	13.199
7	1 49 56.47	2.0125	6 37 59.1	13.159
8	1 51 57.23	2.0128	6 51 7.4	13.118
9	1 53 58.01	2.0132	7 4 13.2	13.076
10	1 55 58.81	2.0135	7 17 16.5	13.033
11	1 57 59.63	2.0139	7 30 17.2	12.989
12	2 0 0.48	2.0145	7 43 15.2	12.944
13	2 2 1.37	2.0152	7 56 10.5	12.899
14	2 4 2.30	2.0158	8 9 3.1	12.853
15	2 6 3.26	2.0164	8 21 52.9	12.806
16	2 8 4.27	2.0171	8 34 39.8	12.758
17	2 10 5.32	2.0179	8 47 23.8	12.709
18	2 12 6.42	2.0187	9 0 4.9	12.659
19	2 14 7.57	2.0197	9 12 42.9	12.608
20	2 16 8.78	2.0207	9 25 17.8	12.556
21	2 18 10.05	2.0217	9 37 49.6	12.504
22	2 20 11.38	2.0227	9 50 18.2	12.450
23	2 22 12.78	2.0238	10 2 43.6	12.395
24	2 24 14.24	2.0249	N. 10 15 5.6	12.339

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	2 24 14.24	2.0249	N.10 15 5.6	12.339
1	2 26 15.77	2.0261	10 27 24.3	12.283
2	2 28 17.38	2.0274	10 39 39.6	12.226
3	2 30 19.06	2.0287	10 51 51.4	12.168
4	2 32 20.82	2.0300	11 3 59.7	12.109
5	2 34 22.66	2.0314	11 16 4.5	12.049
6	2 36 24.59	2.0328	11 28 5.6	11.988
7	2 38 26.60	2.0342	11 40 3.0	11.926
8	2 40 28.70	2.0357	11 51 56.7	11.864
9	2 42 30.89	2.0373	12 3 46.7	11.802
10	2 44 33.18	2.0389	12 15 32.9	11.738
11	2 46 35.56	2.0405	12 27 15.2	11.672
12	2 48 38.04	2.0422	12 38 53.5	11.605
13	2 50 40.62	2.0439	12 50 27.8	11.538
14	2 52 43.30	2.0456	13 1 58.1	11.471
15	2 54 46.09	2.0474	13 13 24.4	11.403
16	2 56 48.99	2.0492	13 24 46.5	11.333
17	2 58 52.00	2.0510	13 36 4.4	11.263
18	3 0 55.11	2.0528	13 47 18.1	11.192
19	3 2 58.34	2.0547	13 58 27.5	11.120
20	3 5 1.68	2.0567	14 9 32.5	11.047
21	3 7 5.14	2.0587	14 20 33.2	10.974
22	3 9 8.72	2.0607	14 31 29.4	10.899
23	3 11 12.42	2.0627	N.14 42 21.1	10.824

SATURDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	3 13 16.24	2.0647	N.14 53 8.3	10.748
1	3 15 20.19	2.0668	15 3 50.9	10.672
2	3 17 24.26	2.0688	15 14 28.9	10.594
3	3 19 28.45	2.0709	15 25 2.2	10.516
4	3 21 32.77	2.0731	15 35 30.8	10.436
5	3 23 37.22	2.0752	15 45 54.5	10.355
6	3 25 41.80	2.0774	15 56 13.4	10.274
7	3 27 46.51	2.0796	16 6 27.4	10.193
8	3 29 51.35	2.0818	16 16 36.5	10.111
9	3 31 56.33	2.0841	16 26 40.7	10.027
10	3 34 1.44	2.0863	16 36 39.8	9.942
11	3 36 6.68	2.0885	16 46 33.8	9.858
12	3 38 12.06	2.0908	16 56 22.8	9.773
13	3 40 17.58	2.0931	17 6 6.6	9.686
14	3 42 23.23	2.0954	17 15 45.1	9.598
15	3 44 29.02	2.0977	17 25 18.4	9.511
16	3 46 34.95	2.1000	17 34 46.4	9.422
17	3 48 41.02	2.1023	17 44 9.1	9.333
18	3 50 47.22	2.1046	17 53 26.4	9.242
19	3 52 53.57	2.1070	18 2 38.2	9.151
20	3 55 0.06	2.1093	18 11 44.5	9.060
21	3 57 6.69	2.1116	18 20 45.4	8.968
22	3 59 13.45	2.1139	18 29 40.7	8.874
23	4 1 20.35	2.1162	18 38 30.3	8.780
24	4 3 27.39	2.1186	N.18 47 14.3	8.686

SUNDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	4 3 27.39	2.1186	N.18 47 14.3	8.686
1	4 5 34.58	2.1210	18 55 52.6	8.590
2	4 7 41.91	2.1233	19 4 25.1	8.494
3	4 9 49.37	2.1255	19 12 51.9	8.398
4	4 11 56.97	2.1277	19 21 12.9	8.301
5	4 14 4.70	2.1300	19 29 28.0	8.203
6	4 16 12.57	2.1323	19 37 37.2	8.104
7	4 18 20.58	2.1346	19 45 40.5	8.005
8	4 20 28.73	2.1369	19 53 37.8	7.904
9	4 22 37.01	2.1391	20 1 29.0	7.802
10	4 24 45.42	2.1413	20 9 14.1	7.701
11	4 26 53.97	2.1436	20 16 53.1	7.599
12	4 29 2.65	2.1458	20 24 26.0	7.497
13	4 31 11.46	2.1479	20 31 52.7	7.393
14	4 33 20.40	2.1501	20 39 13.2	7.289
15	4 35 29.47	2.1522	20 46 27.4	7.185
16	4 37 38.67	2.1544	20 53 35.4	7.080
17	4 39 48.00	2.1565	21 0 37.0	6.974
18	4 41 57.45	2.1585	21 7 32.3	6.868
19	4 44 7.02	2.1606	21 14 21.2	6.761
20	4 46 16.72	2.1627	21 21 3.6	6.653
21	4 48 26.54	2.1647	21 27 39.6	6.546
22	4 50 36.48	2.1666	21 34 9.1	6.438
23	4 52 46.53	2.1685	N.21 40 32.1	6.328

MONDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	4 54 56.70	2.1704	N.21 46 48.5	6.218
1	4 57 6.98	2.1722	21 52 58.3	6.108
2	4 59 17.37	2.1741	21 59 1.5	5.998
3	5 1 27.87	2.1759	22 4 58.1	5.887
4	5 3 38.48	2.1777	22 10 48.0	5.775
5	5 5 49.19	2.1794	22 16 31.1	5.662
6	5 8 0.00	2.1810	22 22 7.5	5.550
7	5 10 10.91	2.1827	22 27 37.1	5.437
8	5 12 21.92	2.1843	22 32 59.9	5.323
9	5 14 33.02	2.1858	22 38 15.9	5.210
10	5 16 44.22	2.1873	22 43 25.1	5.097
11	5 18 55.50	2.1888	22 48 27.5	4.983
12	5 21 6.87	2.1902	22 53 23.0	4.868
13	5 23 18.32	2.1915	22 58 11.6	4.752
14	5 25 29.85	2.1928	23 2 53.2	4.635
15	5 27 41.46	2.1942	23 7 27.8	4.518
16	5 29 53.15	2.1955	23 11 55.4	4.402
17	5 32 4.92	2.1967	23 16 16.0	4.286
18	5 34 16.76	2.1978	23 20 29.7	4.169
19	5 36 28.66	2.1988	23 24 36.3	4.052
20	5 38 40.62	2.1998	23 28 35.9	3.934
21	5 40 52.64	2.2008	23 32 28.4	3.816
22	5 43 4.72	2.2018	23 36 13.8	3.697
23	5 45 16.86	2.2027	23 39 52.1	3.578
24	5 47 29.05	2.2035	N.23 43 23.2	3.459

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 17.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	5 47 29.05	2.2035	N.23 43 23.2	3.459
1	5 49 41.28	2.2043	23 46 47.2	3.341
2	5 51 53.56	2.2050	23 50 4.1	3.222
3	5 54 5.88	2.2056	23 53 13.8	3.102
4	5 56 18.23	2.2062	23 56 16.3	2.982
5	5 58 30.62	2.2067	23 59 11.7	2.863
6	6 0 43.04	2.2072	24 1 59.9	2.743
7	6 2 55.48	2.2076	24 4 40.9	2.623
8	6 5 7.95	2.2080	24 7 14.7	2.502
9	6 7 20.44	2.2083	24 9 41.2	2.382
10	6 9 32.94	2.2085	24 12 0.5	2.262
11	6 11 45.46	2.2087	24 14 12.6	2.142
12	6 13 57.99	2.2088	24 16 17.5	2.021
13	6 16 10.52	2.2088	24 18 15.1	1.900
14	6 18 23.05	2.2088	24 20 5.5	1.779
15	6 20 35.58	2.2088	24 21 48.6	1.658
16	6 22 48.11	2.2087	24 23 24.5	1.537
17	6 25 0.62	2.2084	24 24 53.1	1.417
18	6 27 13.12	2.2081	24 26 14.5	1.296
19	6 29 25.60	2.2078	24 27 28.6	1.175
20	6 31 38.06	2.2075	24 28 35.5	1.054
21	6 33 50.50	2.2071	24 29 35.1	0.933
22	6 36 2.91	2.2065	24 30 27.5	0.813
23	6 38 15.28	2.2059	N.24 31 12.7	0.692

WEDNESDAY 18.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	6 40 27.62	2.2053	N.24 31 50.6	0.572
1	6 42 39.92	2.2046	24 32 21.3	0.452
2	6 44 52.17	2.2038	24 32 44.8	0.331
3	6 47 4.38	2.2031	24 33 1.0	0.210
4	6 49 16.54	2.2022	24 33 10.0	+ 0.090
5	6 51 28.64	2.2012	24 33 11.8	− 0.029
6	6 53 40.69	2.2002	24 33 6.5	0.148
7	6 55 52.67	2.1992	24 32 54.0	0.268
8	6 58 4.59	2.1981	24 32 34.3	0.388
9	7 0 16.44	2.1969	24 32 7.4	0.507
10	7 2 28.22	2.1957	24 31 33.4	0.627
11	7 4 39.92	2.1943	24 30 52.2	0.746
12	7 6 51.54	2.1930	24 30 3.9	0.864
13	7 9 3.08	2.1916	24 29 8.5	0.982
14	7 11 14.53	2.1901	24 28 6.0	1.100
15	7 13 25.89	2.1885	24 26 56.5	1.218
16	7 15 37.15	2.1869	24 25 39.9	1.336
17	7 17 48.32	2.1853	24 24 16.2	1.453
18	7 19 59.39	2.1836	24 22 45.5	1.570
19	7 22 10.35	2.1818	24 21 7.8	1.687
20	7 24 21.21	2.1801	24 19 23.1	1.803
21	7 26 31.96	2.1783	24 17 31.4	1.919
22	7 28 42.60	2.1763	24 15 32.8	2.034
23	7 30 53.12	2.1743	24 13 27.3	2.149
24	7 33 3.52	2.1723	N.24 11 14.9	2.264

THURSDAY 19.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	7 33 3.52	2.1723	N.24 11 14.9	2.264
1	7 35 13.80	2.1702	24 8 55.6	2.379
2	7 37 23.95	2.1681	24 6 29.4	2.493
3	7 39 33.97	2.1659	24 3 56.4	2.607
4	7 41 43.86	2.1638	24 1 16.6	2.720
5	7 43 53.62	2.1616	23 58 30.0	2.833
6	7 46 3.25	2.1593	23 55 36.6	2.946
7	7 48 12.74	2.1569	23 52 36.5	3.058
8	7 50 22.08	2.1544	23 49 29.7	3.169
9	7 52 31.27	2.1520	23 46 16.2	3.280
10	7 54 40.32	2.1496	23 42 56.1	3.390
11	7 56 49.22	2.1471	23 39 29.4	3.501
12	7 58 57.97	2.1445	23 35 56.0	3.612
13	8 1 6.56	2.1419	23 32 16.0	3.721
14	8 3 15.00	2.1393	23 28 29.5	3.829
15	8 5 23.28	2.1367	23 24 36.6	3.936
16	8 7 31.40	2.1340	23 20 37.2	4.044
17	8 9 39.36	2.1312	23 16 31.3	4.151
18	8 11 47.15	2.1284	23 12 19.0	4.258
19	8 13 54.77	2.1257	23 8 0.3	4.364
20	8 16 2.23	2.1229	23 3 35.3	4.470
21	8 18 9.52	2.1200	22 59 3.9	4.576
22	8 20 16.63	2.1171	22 54 26.2	4.680
23	8 22 23.57	2.1142	N.22 49 42.3	4.783

FRIDAY 20.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	8 24 30.34	2.1113	N.22 44 52.2	4.886
1	8 26 36.93	2.1083	22 39 55.9	4.989
2	8 28 43.34	2.1053	22 34 53.5	5.092
3	8 30 49.57	2.1023	22 29 44.9	5.193
4	8 32 55.62	2.0993	22 24 30.3	5.294
5	8 35 1.49	2.0962	22 19 9.6	5.395
6	8 37 7.17	2.0932	22 13 42.9	5.495
7	8 39 12.67	2.0902	22 8 10.2	5.594
8	8 41 17.99	2.0871	22 2 31.6	5.693
9	8 43 23.12	2.0839	21 56 47.1	5.791
10	8 45 28.06	2.0808	21 50 56.7	5.888
11	8 47 32.82	2.0776	21 45 0.5	5.985
12	8 49 37.38	2.0744	21 38 58.5	6.082
13	8 51 41.75	2.0713	21 32 50.7	6.177
14	8 53 45.94	2.0682	21 26 37.2	6.272
15	8 55 49.94	2.0651	21 20 18.1	6.366
16	8 57 53.75	2.0619	21 13 53.3	6.460
17	8 59 57.37	2.0587	21 7 22.9	6.553
18	9 2 0.79	2.0554	21 0 47.0	6.645
19	9 4 4.02	2.0522	20 54 5.5	6.737
20	9 6 7.06	2.0491	20 47 18.5	6.828
21	9 8 9.91	2.0459	20 40 26.1	6.919
22	9 10 12.57	2.0427	20 33 28.2	7.009
23	9 12 15.03	2.0394	20 26 25.0	7.098
24	9 14 17.30	2.0362	N.20 19 16.4	7.187

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	9 14 17.30	2.0362	N.20 19 16.4	7.187
1	9 16 19.38	2.0331	20 12 2.5	7.275
2	9 18 21.27	2.0299	20 4 43.4	7.362
3	9 20 22.97	2.0267	19 57 19.1	7.448
4	9 22 24.48	2.0236	19 49 49.6	7.535
5	9 24 25.80	2.0204	19 42 14.9	7.621
6	9 26 26.93	2.0172	19 34 35.1	7.705
7	9 28 27.87	2.0141	19 26 50.3	7.789
8	9 30 28.62	2.0110	19 19 0.4	7.873
9	9 32 29.19	2.0079	19 11 5.5	7.956
10	9 34 29.57	2.0048	19 3 5.7	8.038
11	9 36 29.77	2.0017	18 55 1.0	8.119
12	9 38 29.78	1.9987	18 46 51.4	8.200
13	9 40 29.61	1.9956	18 38 37.0	8.280
14	9 42 29.25	1.9926	18 30 17.8	8.359
15	9 44 28.71	1.9895	18 21 53.9	8.437
16	9 46 27.99	1.9865	18 13 25.3	8.516
17	9 48 27.09	1.9836	18 4 52.0	8.594
18	9 50 26.02	1.9807	17 56 14.0	8.672
19	9 52 24.77	1.9777	17 47 31.4	8.748
20	9 54 23.34	1.9748	17 38 44.3	8.823
21	9 56 21.74	1.9719	17 29 52.7	8.898
22	9 58 19.97	1.9691	17 20 56.6	8.972
23	10 0 18.03	1.9662	N.17 11 56.1	9.045

SUNDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	10 2 15.91	1.9633	N.17 2 51.2	9.118
1	10 4 13.62	1.9605	16 53 41.9	9.191
2	10 6 11.17	1.9578	16 44 28.3	9.262
3	10 8 8.56	1.9552	16 35 10.5	9.333
4	10 10 5.79	1.9525	16 25 48.4	9.403
5	10 12 2.86	1.9498	16 16 22.1	9.473
6	10 13 59.77	1.9472	16 6 51.6	9.542
7	10 15 56.52	1.9446	15 57 17.0	9.611
8	10 17 53.12	1.9421	15 47 38.3	9.678
9	10 19 49.57	1.9396	15 37 55.6	9.745
10	10 21 45.87	1.9371	15 28 8.9	9.812
11	10 23 42.02	1.9346	15 18 18.2	9.877
12	10 25 38.02	1.9322	15 8 23.6	9.942
13	10 27 33.88	1.9298	14 58 25.1	10.007
14	10 29 29.60	1.9275	14 48 22.7	10.072
15	10 31 25.18	1.9252	14 38 16.5	10.135
16	10 33 20.63	1.9230	14 28 6.5	10.197
17	10 35 15.94	1.9208	14 17 52.8	10.259
18	10 37 11.12	1.9186	14 7 35.4	10.321
19	10 39 6.17	1.9164	13 57 14.3	10.382
20	10 41 1.09	1.9143	13 46 49.6	10.442
21	10 42 55.89	1.9123	13 36 21.3	10.502
22	10 44 50.57	1.9103	13 25 49.4	10.561
23	10 46 45.13	1.9084	13 15 14.0	10.619
24	10 48 39.58	1.9065	N.13 4 35.1	10.677

MONDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	10 48 39.58	1.9065	N.13 4 35.1	10.677
1	10 50 33.91	1.9046	12 53 52.8	10.734
2	10 52 28.13	1.9028	12 43 7.1	10.790
3	10 54 22.25	1.9011	12 32 18.0	10.846
4	10 56 16.26	1.8994	12 21 25.6	10.901
5	10 58 10.17	1.8977	12 10 29.9	10.956
6	11 0 3.99	1.8962	11 59 30.9	11.010
7	11 1 57.71	1.8946	11 48 28.7	11.063
8	11 3 51.34	1.8930	11 37 23.4	11 115
9	11 5 44.87	1.8915	11 26 14.9	11.167
10	11 7 38.32	1.8901	11 15 3.3	11.219
11	11 9 31.69	1.8888	11 3 48.6	11.270
12	11 11 24.98	1.8875	10 52 30.9	11.320
13	11 13 18.19	1.8862	10 41 10.2	11.370
14	11 15 11.33	1.8851	10 29 46.5	11.419
15	11 17 4.40	1.8840	10 18 19.9	11.467
16	11 18 57.41	1.8829	10 6 50.4	11.515
17	11 20 50.35	1.8818	9 55 18.1	11.562
18	11 22 43.23	1.8809	9 43 43.0	11.608
19	11 24 36.06	1.8800	9 32 5.1	11.654
20	11 26 28.83	1.8791	9 20 24.5	11.700
21	11 28 21.55	1.8783	9 8 41.1	11.745
22	11 30 14.23	1.8776	8 56 55.1	11.789
23	11 32 6.86	1.8769	N. 8 45 6.5	11.832

TUESDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	11 33 59.45	1.8763	N. 8 33 15.3	11.875
1	11 35 52.01	1.8758	8 21 21.5	11.917
2	11 37 44.54	1.8753	8 9 25.2	11.958
3	11 39 37.04	1.8748	7 57 26.5	11.999
4	11 41 29.51	1.8744	7 45 25.3	12.040
5	11 43 21.97	1.8741	7 33 21.7	12.080
6	11 45 14.41	1.8738	7 21 15.7	12.119
7	11 47 6.83	1.8737	7 9 7.4	12.157
8	11 48 59.25	1.8736	6 56 56.8	12.195
9	11 50 51.66	1.8735	6 44 44.0	12.232
10	11 52 44.07	1.8735	6 32 29.0	12.268
11	11 54 36.48	1.8735	6 20 11.8	12.305
12	11 56 28.89	1.8736	6 7 52.4	12.341
13	11 58 21.31	1.8738	5 55 30.9	12.375
14	12 0 13.75	1.8742	5 43 7.4	12.408
15	12 2 6.21	1.8745	5 30 41.9	12.441
16	12 3 58.69	1.8748	5 18 14.4	12.474
17	12 5 51.19	1.8752	5 5 45.0	12.507
18	12 7 43.72	1.8758	4 53 13.6	12.538
19	12 9 36.29	1.8764	4 40 40.4	12.568
20	12 11 28.89	1.8770	4 28 5.4	12.598
21	12 13 21.53	1.8778	4 15 28.6	12.628
22	12 15 14.22	1.8786	4 2 50.0	12.658
23	12 17 6.96	1.8794	3 50 9.6	12.687
24	12 18 59.75	1.8803	N. 3 37 27.6	12.714

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 25.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	12 18 59.75	1.8803	N. 3 37 27.6	12.714
1	12 20 52.60	1.8813	3 24 44.0	12.740
2	12 22 45.51	1.8824	3 11 58.8	12.766
3	12 24 38.49	1.8836	2 59 12.1	12.791
4	12 26 31.54	1.8848	2 46 23.9	12.816
5	12 28 24.67	1.8861	2 33 34.2	12.840
6	12 30 17.88	1.8875	2 20 43.1	12.863
7	12 32 11.17	1.8888	2 7 50.6	12.886
8	12 34 4.54	1.8902	1 54 56.8	12.908
9	12 35 58.00	1.8918	1 42 1.7	12.929
10	12 37 51.56	1.8935	1 29 5.3	12.949
11	12 39 45.22	1.8953	1 16 7.8	12.968
12	12 41 38.99	1.8971	1 3 9.1	12.987
13	12 43 32.87	1.8989	0 50 9.3	13.006
14	12 45 26.86	1.9008	0 37 8.4	13.024
15	12 47 20.97	1.9029	0 24 6.4	13.041
16	12 49 15.21	1.9050	N. 0 11 3.5	13.057
17	12 51 9.57	1.9071	S. 0 2 0.4	13.072
18	12 53 4.06	1.9093	0 15 5.2	13.087
19	12 54 58.68	1.9116	0 28 10.8	13.100
20	12 56 53.45	1.9141	0 41 17.2	13.112
21	12 58 48.37	1.9166	0 54 24.3	13.124
22	13 0 43.44	1.9191	1 7 32.1	13.136
23	13 2 38.66	1.9217	S. 1 20 40.6	13.147

THURSDAY 26.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	13 4 34.04	1.9244	S. 1 33 49.8	13.157
1	13 6 29.59	1.9271	1 46 59.5	13.166
2	13 8 25.30	1.9299	2 0 9.7	13.173
3	13 10 21.18	1.9328	2 13 20.3	13.180
4	13 12 17.24	1.9359	2 26 31.3	13.187
5	13 14 13.49	1.9390	2 39 42.7	13.192
6	13 16 9.92	1.9421	2 52 54.4	13.197
7	13 18 6.54	1.9453	3 6 6.3	13.200
8	13 20 3.36	1.9486	3 19 18.4	13.203
9	13 22 0.38	1.9520	3 32 30.7	13.205
10	13 23 57.60	1.9554	3 45 43.0	13.206
11	13 25 55.03	1.9590	3 58 55.4	13.207
12	13 27 52.68	1.9627	4 12 7.8	13.206
13	13 29 50.55	1.9664	4 25 20.1	13.204
14	13 31 48.64	1.9701	4 38 32.3	13.201
15	13 33 46.96	1.9740	4 51 44.2	13.197
16	13 35 45.52	1.9779	5 4 55.9	13.192
17	13 37 44.31	1.9818	5 18 7.3	13.187
18	13 39 43.34	1.9859	5 31 18.3	13.180
19	13 41 42.62	1.9901	5 44 28.9	13.172
20	13 43 42.15	1.9943	5 57 39.0	13.164
21	13 45 41.94	1.9987	6 10 48.6	13.155
22	13 47 41.99	2.0031	6 23 57.6	13.143
23	13 49 42.31	2.0076	6 37 5.8	13.131
24	13 51 42.90	2.0121	S. 6 50 13.3	13.118

FRIDAY 27.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	13 51 42.90	2.0121	S. 6 50 13.3	13.118
1	13 53 43.76	2.0168	7 3 20.0	13.105
2	13 55 44.91	2.0215	7 16 25.9	13.090
3	13 57 46.34	2.0262	7 29 30.8	13.074
4	13 59 48.06	2.0311	7 42 34.7	13.057
5	14 1 50.07	2.0360	7 55 37.6	13.038
6	14 3 52.38	2.0411	8 8 39.3	13.018
7	14 5 55.00	2.0462	8 21 39.8	12.997
8	14 7 57.93	2.0514	8 34 39.0	12.975
9	14 10 1.17	2.0566	8 47 36.8	12.952
10	14 12 4.72	2.0618	9 0 33.2	12.928
11	14 14 8.59	2.0672	9 13 28.2	12.904
12	14 16 12.79	2.0727	9 26 21.7	12.877
13	14 18 17.32	2.0783	9 39 13.5	12.848
14	14 20 22.19	2.0840	9 52 3.5	12.818
15	14 22 27.40	2.0897	10 4 51.7	12.788
16	14 24 32.95	2.0954	10 17 38.1	12.757
17	14 26 38.85	2.1012	10 30 22.5	12.723
18	14 28 45.10	2.1072	10 43 4.9	12.689
19	14 30 51.71	2.1132	10 55 45.2	12.654
20	14 32 58.68	2.1192	11 8 23.3	12.617
21	14 35 6.02	2.1254	11 20 59.2	12.578
22	14 37 13.73	2.1316	11 33 32.7	12.538
23	14 39 21.81	2.1378	S. 11 46 3.8	12.497

SATURDAY 28.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	14 41 30.27	2.1442	S. 11 58 32.4	12.455
1	14 43 39.11	2.1506	12 10 58.4	12.411
2	14 45 48.34	2.1571	12 23 21.7	12.365
3	14 47 57.96	2.1636	12 35 42.2	12.318
4	14 50 7.97	2.1702	12 47 59.9	12.270
5	14 52 18.38	2.1768	13 0 14.6	12.220
6	14 54 29.19	2.1836	13 12 26.3	12.169
7	14 56 40.41	2.1904	13 24 34.9	12.117
8	14 58 52.04	2.1972	13 36 40.3	12.062
9	15 1 4.08	2.2041	13 48 42.3	12.005
10	15 3 16.53	2.2110	14 0 40.9	11.947
11	15 5 29.40	2.2180	14 12 36.0	11.889
12	15 7 42.69	2.2251	14 24 27.6	11.829
13	15 9 56.41	2.2322	14 36 15.5	11.767
14	15 12 10.56	2.2394	14 47 59.6	11.703
15	15 14 25.14	2.2467	14 59 39.8	11.638
16	15 16 40.16	2.2540	15 11 16.1	11.571
17	15 18 55.62	2.2613	15 22 48.3	11.503
18	15 21 11.51	2.2686	15 34 16.3	11.432
19	15 23 27.85	2.2761	15 45 40.1	11.360
20	15 25 44.64	2.2835	15 56 59.5	11.286
21	15 28 1.87	2.2909	16 8 14.4	11.210
22	15 30 19.55	2.2985	16 19 24.7	11.133
23	15 32 37.69	2.3061	16 30 30.4	11.055
24	15 34 56.28	2.3137	S. 16 41 31.3	10.974

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 29

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	15 34 56.28	2.3137	S. 16 41 31.3	10.974
1	15 37 15.33	2.3213	16 52 27.3	10.892
2	15 39 34.84	2.3290	17 3 18.3	10.808
3	15 41 54.81	2.3367	17 14 4.3	10.723
4	15 44 15.24	2.3444	17 24 45.1	10.635
5	15 46 36.14	2.3522	17 35 20.5	10.545
6	15 48 57.50	2.3599	17 45 50.5	10.454
7	15 51 19.33	2.3677	17 56 15.0	10.362
8	15 53 41.62	2.3754	18 6 33.9	10.267
9	15 56 4.38	2.3832	18 16 47.1	10.171
10	15 58 27.61	2.3911	18 26 54.4	10.072
11	16 0 51.31	2.3989	18 36 55.8	9.972
12	16 3 15.48	2.4067	18 46 51.1	9.870
13	16 5 40.12	2.4146	18 56 40.2	9.767
14	16 8 5.23	2.4224	19 6 23.1	9.662
15	16 10 30.81	2.4303	19 15 59.6	9.554
16	16 12 56.86	2.4381	19 25 29.6	9.445
17	16 15 23.38	2.4458	19 34 53.0	9.333
18	16 17 50.36	2.4536	19 44 9.6	9.220
19	16 20 17.81	2.4614	19 53 19.4	9.106
20	16 22 45.73	2.4692	20 2 22.3	8.989
21	16 25 14.12	2.4770	20 11 18.1	8.871
22	16 27 42.97	2.4847	20 20 6.8	8.751
23	16 30 12.28	2.4923	S. 20 28 48.2	8.628

MONDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	16 32 42.05	2.5000	S. 20 37 22.2	8.504
1	16 35 12.28	2.5076	20 45 48.7	8.378
2	16 37 42.96	2.5152	20 54 7.6	8.251
3	16 40 14.10	2.5227	21 2 18.9	8.122
4	16 42 45.69	2.5302	21 10 22.3	7.991
5	16 45 17.72	2.5376	21 18 17.8	7.858
6	16 47 50.20	2.5450	21 26 5.3	7.723
7	16 50 23.12	2.5523	21 33 44.6	7.587
8	16 52 56.47	2.5595	21 41 15.7	7.448
9	16 55 30.26	2.5667	21 48 38.4	7.307
10	16 58 4.48	2.5738	21 55 52.6	7.166
11	17 0 39.12	2.5809	22 2 58.3	7.023
12	17 3 14.19	2.5879	22 9 55.4	6.878
13	17 5 49.67	2.5948	22 16 43.7	6.731
14	17 8 25.56	2.6016	22 23 23.1	6.582
15	17 11 1.86	2.6083	22 29 53.6	6.432
16	17 13 38.56	2.6149	22 36 15.0	6.280
17	17 16 15.65	2.6214	22 42 27.2	6.127
18	17 18 53.13	2.6278	22 48 30.2	5.972
19	17 21 30.99	2.6342	22 54 23.8	5.815
20	17 24 9.23	2.6404	23 0 8.0	5.657
21	17 26 47.84	2.6465	23 5 42.7	5.497
22	17 29 26.81	2.6525	23 11 7.7	5.336
23	17 32 6.14	2.6584	23 16 23.0	5.173
24	17 34 45.82	2.6642	S. 23 21 28.5	5.009

TUESDAY, JULY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	17 34 45.82	2.6642	S. 23 21 28.5	5.009

PHASES OF THE MOON.

		d	h	m
○ Full Moon	. . June	2	18	34.2
☾ Last Quarter	. . . .	9	9	49.9
● New Moon	. . . .	16	21	57.7
☽ First Quarter	. . .	25	1	53.6

		d	h
☾ Perigee. . . .	June	4	22.1
☾ Apogee.	.	20	15.5

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Saturn	W.	79° 16′ 9″	2370	81° 0′ 27″	2355	82° 45′ 6″	2341	84° 30′ 7″	2326
	Regulus	W.	79 1 53	2359	80 46 26	2343	82 31 23	2328	84 16 41	2314
	Spica	W.	25 33 6	2499	27 14 20	2469	28 56 19	2440	30 38 57	2413
	α Aquilæ	E.	73 33 32	3163	72 6 38	3164	70 39 46	3167	69 12 58	3173
	Jupiter	E.	84 51 50	2352	83 7 6	2336	81 22 1	2321	79 36 33	2307
2	Saturn	W.	93 20 15	2259	95 7 14	2247	96 54 30	2236	98 42 4	2225
	Regulus	W.	93 8 17	2248	94 55 33	2236	96 43 7	2225	98 30 58	2214
	Spica	W.	39 20 49	2307	41 6 38	2290	42 52 52	2274	44 39 29	2259
	α Aquilæ	E.	62 1 46	3246	60 36 31	3269	59 11 44	3299	57 47 31	3332
	Jupiter	E.	70 44 11	2241	68 56 45	2229	67 9 2	2218	65 21 1	2207
	Fomalhaut	E.	91 31 30	2411	89 48 12	2399	88 4 36	2388	86 20 45	2378
3	Regulus	W.	107 34 2	2168	109 23 18	2161	111 12 46	2154	113 2 23	2147
	Spica	W.	53 37 37	2198	55 26 7	2189	57 14 51	2180	59 3 48	2172
	α Aquilæ	E.	50 58 6	3587	49 39 18	3662	48 21 51	3747	47 5 54	3840
	Jupiter	E.	56 17 12	2161	54 27 46	2154	52 38 10	2148	50 48 24	2142
	Fomalhaut	E.	77 38 12	2340	75 53 11	2336	74 8 3	2332	72 22 50	2330
	α Pegasi	E.	95 29 10	2573	93 49 38	2565	92 9 53	2557	90 29 57	2550
4	Spica	W.	68 11 17	2143	70 1 11	2139	71 51 11	2135	73 41 16	2133
	Jupiter	E.	41 37 33	2121	39 47 7	2119	37 56 39	2118	36 6 8	2119
	Fomalhaut	E.	63 36 20	2333	61 51 9	2338	60 6 5	2345	58 21 12	2353
	α Pegasi	E.	82 8 33	2535	80 28 9	2537	78 47 47	2540	77 7 30	2545
5	Spica	W.	82 52 16	2131	84 42 27	2132	86 32 37	2135	88 22 43	2137
	Mars	W.	41 47 21	2028	43 40 11	2028	45 33 0	2029	47 25 48	2031
	Antares	W.	37 2 17	2163	38 51 39	2160	40 41 6	2158	42 30 36	2158
	Fomalhaut	E.	49 40 28	2421	47 57 24	2442	46 14 50	2466	44 32 50	2494
	α Pegasi	E.	68 48 27	2593	67 9 24	2609	65 30 41	2626	63 52 22	2645
	α Arietis	E.	110 53 37	2246	109 6 19	2245	107 18 59	2244	105 31 38	2244
6	Spica	W.	97 31 56	2159	99 21 25	2165	101 10 45	2171	102 59 56	2178
	Mars	W.	56 48 43	2050	58 40 59	2055	60 33 7	2061	62 25 7	2067
	Antares	W.	51 37 58	2166	53 27 16	2170	55 16 28	2175	57 5 34	2180
	α Pegasi	E.	55 48 27	2783	54 13 37	2819	52 39 34	2859	51 6 23	2905
	α Arietis	E.	96 35 23	2258	94 48 22	2263	93 1 29	2269	91 14 44	2275
7	Mars	W.	71 42 26	2104	73 33 19	2112	75 23 58	2121	77 14 24	2130
	Antares	W.	66 8 49	2213	67 56 57	2221	69 44 53	2229	71 32 37	2237
	α Arietis	E.	82 23 38	2317	80 38 2	2326	78 52 42	2336	77 7 36	2348
	Sun	E.	121 56 55	2481	120 15 15	2490	118 33 48	2499	116 52 34	2509
8	Mars	W.	86 22 55	2181	88 11 51	2191	90 0 31	2202	91 48 56	2213
	Antares	W.	80 27 53	2286	82 14 13	2296	84 0 18	2306	85 46 7	2317
	α Aquilæ	W.	43 53 48	4162	45 2 50	4056	46 13 34	3960	47 25 53	3877
	α Arietis	E.	68 26 29	2412	66 43 12	2427	65 0 16	2442	63 17 42	2458
	Sun	E.	108 29 56	2563	106 50 9	2574	105 10 38	2585	103 31 22	2597
9	Mars	W.	100 46 50	2269	102 33 34	2280	104 20 1	2292	106 6 11	2304
	Antares	W.	94 31 19	2373	96 15 32	2384	97 59 29	2395	99 43 10	2406
	Jupiter	W.	31 28 11	2366	33 12 34	2375	34 56 45	2384	36 40 44	2393

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Saturn	W.	86° 15′ 28″	2311	88° 1′ 11″	2297	89° 47′ 13″	2284	91° 33′ 34″	2271
	Regulus	W.	86 2 20	2300	87 48 19	2287	89 34 39	2274	91 21 18	2261
	Spica	W.	32 22 14	2387	34 6 7	2365	35 50 32	2345	37 35 26	2325
	α Aquilæ	E.	67 46 17	3181	66 19 46	3192	64 53 28	3207	63 27 27	3224
	Jupiter	E.	77 50 45	2293	76 4 36	2279	74 18 7	2266	72 31 19	2253
2	Saturn	W.	100 29 53	2215	102 17 58	2205	104 6 18	2196	105 54 52	2187
	Regulus	W.	100 19 6	2203	102 7 29	2194	103 56 6	2185	105 44 58	2176
	Spica	W.	46 26 28	2246	48 13 48	2233	50 1 27	2221	51 49 23	2209
	α Aquilæ	E.	56 23 56	3371	55 1 7	3415	53 39 7	3466	52 18 5	3522
	Jupiter	E.	63 32 45	2197	61 44 13	2187	59 55 26	2178	58 6 25	2169
	Fomalhaut	E.	84 36 39	2369	82 52 20	2360	81 7 48	2352	79 23 5	2345
3	Regulus	W.	114 52 11	2141	116 42 7	2137	118 32 10	2133	120 22 20	2129
	Spica	W.	60 52 58	2165	62 42 18	2158	64 31 49	2152	66 21 29	2147
	α Aquilæ	E.	45 51 31	3946	44 38 58	4069	43 28 28	4204	42 20 6	4367
	Jupiter	E.	48 58 28	2136	47 8 24	2131	45 18 12	2127	43 27 55	2124
	Fomalhaut	E.	70 37 33	2328	68 52 14	2327	67 6 54	2328	65 21 36	2330
	α Pegasi	E.	88 49 51	2543	87 9 38	2540	85 29 19	2537	83 48 57	2536
4	Spica	W.	75 31 25	2131	77 21 36	2130	79 11 49	2130	81 2 2	2129
	Jupiter	E.	34 15 38	2120	32 25 10	2122	30 34 45	2125	28 44 24	2128
	Fomalhaut	E.	56 36 30	2363	54 52 1	2375	53 7 50	2388	51 23 58	2403
	α Pegasi	E.	75 27 19	2552	73 47 18	2559	72 7 27	2569	70 27 49	2580
5	Spica	W.	90 12 45	2140	92 2 43	2143	93 52 34	2148	95 42 19	2153
	Mars	W.	49 18 32	2034	51 11 13	2037	53 3 49	2041	54 56 19	2045
	Antares	W.	44 20 7	2158	46 9 38	2158	47 59 8	2160	49 48 35	2163
	Fomalhaut	E.	42 51 29	2524	41 10 50	2561	39 31 2	2601	37 52 8	2647
	α Pegasi	E.	62 14 29	2668	60 37 6	2692	59 0 16	2719	57 24 1	2749
	α Arietis	E.	103 44 17	2946	101 56 58	2948	100 9 42	2950	98 22 29	2954
6	Spica	W.	104 48 55	2186	106 37 44	2194	108 26 20	2202	110 14 44	2211
	Mars	W.	64 16 56	2073	66 8 36	2080	68 0 4	2088	69 51 21	2096
	Antares	W.	58 54 31	2186	60 43 21	2192	62 32 0	2198	64 20 30	2205
	α Pegasi	E.	49 34 11	2954	48 3 1	3008	46 32 59	3069	45 4 12	3137
	α Arietis	E.	89 28 8	2282	87 41 43	2290	85 55 29	2298	84 9 27	2307
7	Mars	W.	79 4 35	2140	80 54 33	2150	82 44 15	2160	84 33 43	2170
	Antares	W.	73 20 7	2946	75 7 25	2955	76 54 28	2965	78 41 18	2975
	α Arietis	E.	75 22 47	2360	73 38 15	2372	71 54 1	2385	70 10 5	2398
	Sun	E.	115 11 33	2519	113 30 47	2530	111 50 15	2541	110 9 58	2552
8	Mars	W.	93 37 4	2224	95 24 56	2235	97 12 31	2246	98 59 49	2257
	Antares	W.	87 31 41	2328	89 17 0	2339	91 2 2	2350	92 46 48	2361
	α Aquilæ	W.	48 39 36	3802	49 54 36	3737	51 10 44	3677	52 27 55	3626
	α Arietis	E.	61 35 30	2474	59 53 41	2491	58 12 16	2510	56 31 17	2529
	Sun	E.	101 52 22	2608	100 13 38	2619	98 35 10	2630	96 56 58	2642
9	Mars	W.	107 52 4	2316	109 37 40	2328	111 22 59	2340	113 8 0	2352
	Antares	W.	101 26 34	2418	103 9 42	2430	104 52 33	2442	106 35 7	2453
	Jupiter	W.	38 24 29	2403	40 7 59	2413	41 51 16	2423	43 34 18	2433

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
9	α Aquilæ	W.	53° 46′ 1″	3580	55° 4′ 57″	3538	56° 24′ 38″	3504	57° 44′ 58″	3471
	α Arietis	E.	54 50 43	2548	53 10 37	2569	51 30 59	2590	49 51 51	2613
	SUN	E.	95 19 2	2655	93 41 22	2667	92 3 59	2679	90 26 52	2691
10	α Aquilæ	W.	64 34 10	3365	65 57 6	3352	67 20 18	3341	68 43 42	3332
	JUPITER	W.	45 17 6	2443	46 59 39	2453	48 41 57	2463	50 24 1	2473
	α Arietis	E.	41 44 32	2752	40 9 1	2786	38 34 13	2822	37 0 14	2862
	SUN	E.	82 25 20	2752	80 49 50	2764	79 14 36	2776	77 39 38	2788
11	α Aquilæ	W.	75 42 39	3311	77 6 37	3312	78 30 34	3314	79 54 30	3317
	JUPITER	W.	58 50 42	2527	60 31 18	2537	62 11 41	2547	63 51 49	2557
	Fomalhaut	W.	40 32 48	2955	42 3 57	2938	43 35 25	2924	45 7 13	2914
	SUN	E.	69 48 40	2847	68 15 14	2859	66 42 3	2871	65 9 7	2883
12	α Aquilæ	W.	86 52 56	3345	88 16 15	3354	89 39 24	3363	91 2 22	3375
	JUPITER	W.	72 9 2	2606	73 47 48	2616	75 26 21	2625	77 4 40	2635
	Fomalhaut	W.	52 48 37	2890	54 21 9	2888	55 53 43	2888	57 26 17	2889
	α Pegasi	W.	39 39 19	3785	40 54 37	3720	42 11 3	3661	43 28 31	3610
	SUN	E.	57 28 2	2937	55 56 31	2948	54 25 13	2959	52 54 9	2970
13	α Aquilæ	W.	97 53 48	3441	99 15 18	3457	100 36 29	3475	101 57 21	3494
	JUPITER	W.	85 13 7	2683	86 50 10	2692	88 27 2	2701	90 3 41	2710
	Fomalhaut	W.	65 8 36	2901	66 40 53	2906	68 13 4	2911	69 45 9	2916
	α Pegasi	W.	50 7 40	3435	51 29 17	3411	52 51 21	3391	54 13 48	3372
	SUN	E.	45 22 6	3021	43 52 20	3031	42 22 46	3041	40 53 25	3051
14	JUPITER	W.	98 4 2	2753	99 39 31	2762	101 14 50	2771	102 49 57	2779
	Fomalhaut	W.	77 23 52	2945	78 55 14	2951	80 26 27	2958	81 57 32	2965
	α Pegasi	W.	61 10 25	3314	62 34 22	3306	63 58 26	3301	65 22 38	3296
	SUN	E.	33 29 36	3099	32 1 25	3109	30 33 25	3118	29 5 37	3127
18	SUN	W.	12 8 8	3356	13 31 14	3362	14 54 13	3368	16 17 5	3374
	Regulus	E.	49 6 15	3021	47 36 28	3027	46 6 49	3033	44 37 19	3040
	SATURN	E.	49 57 16	3039	48 27 52	3046	46 58 37	3053	45 29 29	3059
	Spica	E.	103 9 10	3030	101 39 35	3035	100 10 6	3040	98 40 43	3045
19	SUN	W.	23 9 50	3401	24 32 5	3406	25 54 15	3410	27 16 21	3415
	Regulus	E.	37 11 54	3075	35 43 14	3082	34 14 42	3089	32 46 19	3096
	SATURN	E.	38 5 43	3089	36 37 20	3095	35 9 3	3101	33 40 53	3106
	Spica	E.	91 15 24	3070	89 46 38	3075	88 17 56	3079	86 49 20	3063
20	SUN	W.	34 5 40	3432	35 27 20	3434	36 48 58	3436	38 10 34	3438
	Spica	E.	79 27 26	3099	77 59 16	3102	76 31 8	3104	75 3 3	3106
	MARS	E.	116 26 58	3018	114 57 8	3021	113 27 22	3023	111 57 38	3026
	Antares	E.	125 21 44	3103	123 53 38	3104	122 25 34	3105	120 57 31	3106
21	SUN	W.	44 58 5	3443	46 19 33	3443	47 41 1	3442	49 2 30	3441
	Spica	E.	67 43 15	3113	66 15 22	3114	64 47 30	3115	63 19 39	3115
	MARS	E.	104 29 30	3031	102 59 56	3032	101 30 23	3032	100 0 50	3031
	Antares	E.	113 37 23	3106	112 9 21	3105	110 41 19	3104	109 13 15	3104
22	SUN	W.	55 50 17	3431	57 11 58	3427	58 33 43	3423	59 55 33	3419

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
9	α Aquilæ	W.	59° 5′ 54″	3444	60° 27′ 21″	3420	61° 49′ 14″	3399	63° 11′ 31″	3380
	α Arietis	E.	48 13 14	2637	46 35 9	2663	44 57 40	2690	43 20 46	2719
	Sun	E.	88 50 1	2704	87 13 27	2716	85 37 8	2728	84 1 6	2740
10	α Aquilæ	W.	70 7 16	3324	71 30 59	3318	72 54 49	3315	74 18 42	3312
	Jupiter	W.	52 5 50	2484	53 47 25	2494	55 28 45	2505	57 9 50	2516
	α Arietis	E.	35 27 7	2908	33 54 59	2958	32 23 54	3013	30 53 58	3077
	Sun	E.	76 4 56	2800	74 30 29	2812	72 56 17	2824	71 22 21	2836
11	α Aquilæ	W.	81 18 22	3320	82 42 10	3324	84 5 53	3330	85 29 29	3337
	Jupiter	W.	65 31 43	2566	67 11 24	2576	68 50 50	2586	70 30 3	2597
	Fomalhaut	W.	46 39 14	2907	48 11 24	2900	49 43 43	2895	51 16 8	2892
	Sun	E.	63 36 25	2893	62 3 58	2904	60 31 45	2915	58 59 46	2926
12	α Aquilæ	W.	92 25 7	3387	93 47 40	3399	95 9 58	3412	96 32 1	3426
	Jupiter	W.	78 42 47	2645	80 20 41	2655	81 58 22	2665	83 35 51	2674
	Fomalhaut	W.	58 58 50	2890	60 31 21	2892	62 3 50	2895	63 36 15	2897
	α Pegasi	W.	44 46 54	3566	46 6 5	3526	47 26 0	3492	48 46 33	3461
	Sun	E.	51 23 19	2980	49 52 41	2991	48 22 17	3001	46 52 5	3011
13	α Aquilæ	W.	103 17 52	3513	104 38 2	3534	105 57 50	3555	107 17 13	3578
	Jupiter	W.	91 40 9	2718	93 16 24	2727	94 52 28	2736	96 28 21	2745
	Fomalhaut	W.	71 17 8	2921	72 49 0	2927	74 20 45	2933	75 52 22	2939
	α Pegasi	W.	55 36 36	3356	56 59 42	3343	58 23 4	3332	59 46 39	3322
	Sun	E.	39 24 15	3061	37 55 18	3071	36 26 32	3081	34 57 58	3090
14	**Jupiter**	W.	104 24 53	2787	105 59 38	2795	107 34 12	2803	109 8 36	2811
	Fomalhaut	W.	83 28 27	2972	84 59 14	2980	86 29 51	2988	88 0 19	2996
	α Pegasi	W.	66 46 54	3393	68 11 15	3390	69 35 38	3388	71 0 4	3387
	Sun	E.	27 38 0	3136	26 10 34	3145	24 43 19	3154	23 16 14	3163
18	**Sun**	W.	17 39 51	3380	19 2 30	3385	20 25 2	3390	21 47 29	3396
	Regulus	E.	43 7 58	3047	41 38 44	3054	40 9 39	3061	38 40 42	3068
	Saturn	E.	44 0 29	3065	42 31 37	3071	41 2 52	3077	39 34 14	3083
	Spica	E.	97 11 28	3050	95 42 18	3055	94 13 14	3060	92 44 16	3065
19	**Sun**	W.	28 38 21	3419	30 0 16	3423	31 22 8	3426	32 43 56	3429
	Regulus	E.	31 18 4	3104	29 50 0	3112	28 22 5	3120	26 54 20	3128
	Saturn	E.	32 12 51	3111	30 44 55	3117	29 17 7	3123	27 49 25	3129
	Spica	E.	85 20 49	3087	83 52 22	3090	82 23 59	3093	80 55 41	3096
20	**Sun**	W.	39 32 7	3440	40 53 38	3441	42 15 8	3442	43 36 37	3443
	Spica	E.	73 35 2	3108	72 7 2	3110	70 39 5	3111	69 11 9	3112
	Mars	E.	110 27 56	3027	108 58 17	3029	107 28 40	3030	105 59 4	3031
	Antares	E.	119 29 28	3107	118 1 27	3107	116 33 26	3107	115 5 25	3106
21	**Sun**	W.	50 23 59	3440	51 45 30	3438	53 7 3	3436	54 28 39	3434
	Spica	E.	61 51 48	3114	60 23 56	3114	58 56 4	3113	57 28 11	3113
	Mars	E.	98 31 16	3031	97 1 42	3029	95 32 6	3028	94 2 29	3027
	Antares	E.	107 45 10	3102	106 17 3	3100	104 48 53	3098	103 20 41	3095
22	**Sun**	W.	61 17 27	3415	62 39 26	3410	64 1 31	3404	65 23 43	3398

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
22	Spica	E.	56° 0′ 17″	3112	54° 32′ 22″	3110	53° 4′ 25″	3108	51° 36′ 26″	3106
	Mars	E.	92 32 50	3026	91 3 8	3023	89 33 23	3020	88 3 35	3016
	Antares	E.	101 52 25	3092	100 24 6	3089	98 55 43	3085	97 27 15	3081
23	Sun	W.	66 46 1	3391	68 8 27	3384	69 31 1	3377	70 53 43	3369
	Spica	E.	44 15 51	3095	42 47 35	3093	41 19 16	3090	39 50 53	3087
	Mars	E.	80 33 26	2995	79 3 7	2990	77 32 42	2984	76 2 9	2978
	Antares	E.	90 3 33	3055	88 34 29	3048	87 5 16	3041	85 35 56	3034
24	Sun	W.	77 49 40	3323	79 13 25	3312	80 37 22	3301	82 1 32	3291
	Regulus	W.	22 49 12	3045	24 18 29	3027	25 48 8	3010	27 18 8	2992
	Mars	E.	68 27 16	2940	66 55 48	2931	65 24 9	2922	63 52 19	2913
	Antares	E.	78 6 49	2992	76 36 27	2983	75 5 53	2973	73 35 7	2963
25	Sun	W.	89 5 57	3224	90 31 37	3209	91 57 34	3195	93 23 48	3180
	Regulus	W.	34 53 14	2913	36 25 16	2898	37 57 38	2882	39 30 20	2866
	Saturn	W.	33 17 17	2930	34 48 57	2915	36 20 55	2900	37 53 13	2885
	Mars	E.	56 10 0	2861	54 36 51	2850	53 3 27	2839	51 29 49	2827
	Antares	E.	65 57 52	2905	64 25 40	2893	62 53 13	2880	61 20 30	2867
	α Aquilæ	E.	110 44 6	3729	109 27 50	3699	108 11 4	3671	106 53 46	3644
26	Sun	W.	100 39 40	3099	102 7 50	3082	103 36 22	3065	105 5 15	3047
	Regulus	W.	47 19 2	2784	48 53 51	2767	50 29 3	2750	52 4 38	2732
	Saturn	W.	45 39 45	2805	47 14 6	2788	48 48 49	2770	50 23 54	2754
	Mars	E.	43 37 40	2763	42 2 24	2751	40 26 52	2739	38 51 4	2726
	Antares	E.	53 32 32	2798	51 58 2	2784	50 23 14	2769	48 48 6	2754
	α Aquilæ	E.	100 20 14	3519	99 0 11	3497	97 39 42	3475	96 18 50	3454
27	Sun	W.	112 35 19	2953	114 6 31	2934	115 38 7	2914	117 10 8	2894
	Regulus	W.	60 8 26	2641	61 46 25	2623	63 24 49	2605	65 3 37	2586
	Saturn	W.	58 25 8	2665	60 2 35	2647	61 40 27	2629	63 18 44	2610
	Antares	E.	40 47 38	2683	39 10 35	2670	37 33 14	2657	35 55 34	2644
	α Aquilæ	E.	89 28 44	3357	88 5 39	3341	86 42 16	3325	85 18 34	3311
	Jupiter	E.	102 37 14	2605	100 58 26	2586	99 19 13	2568	97 39 35	2550
28	Regulus	W.	73 24 11	2491	75 5 36	2472	76 47 27	2453	78 29 46	2435
	Saturn	W.	71 36 32	2516	73 17 24	2497	74 58 42	2478	76 40 27	2459
	Spica	W.	20 10 11	2717	21 46 28	2668	23 23 50	2625	25 2 11	2584
	α Aquilæ	E.	78 16 12	3253	76 51 6	3246	75 25 50	3239	74 0 27	3234
	Jupiter	E.	89 15 3	2457	87 32 50	2438	85 50 11	2420	84 7 5	2402
29	Regulus	W.	87 7 56	2343	88 52 52	2325	90 38 15	2308	92 24 2	2291
	Spica	W.	33 26 30	2426	35 9 28	2400	36 53 3	2375	38 37 13	2352
	α Aquilæ	E.	66 52 53	3240	65 27 31	3249	64 2 19	3259	62 37 20	3274
	Jupiter	E.	75 25 1	2311	73 39 18	2293	71 53 9	2276	70 6 34	2259
	Fomalhaut	E.	97 18 42	2509	95 37 41	2490	93 56 15	2472	92 14 23	2454
30	Regulus	W.	101 19 12	2210	103 7 25	2196	104 55 59	2182	106 44 56	2168
	Spica	W.	47 25 59	2250	49 13 11	2232	51 0 50	2215	52 48 54	2199
	α Aquilæ	E.	55 38 5	3406	54 15 56	3449	52 54 35	3496	51 34 6	3553
	Fomalhaut	E.	83 39 5	2376	81 54 56	2363	80 10 28	2351	78 25 42	2339
	α Pegasi	E.	101 10 14	2628	99 31 58	2608	97 53 14	2590	96 14 6	2574

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV$^{\text{h}}$.	P. L. of Diff.	XVIII$^{\text{h}}$.	P. L. of Diff.	XXI$^{\text{h}}$.	P. L. of Diff.
22	Spica	E.	50° 8′ 25″	3104	48° 40′ 21″	3102	47° 12′ 14″	3100	45° 44′ 4″	3098
	MARS	E.	86 33 43	3012	85 3 46	3008	83 33 45	3004	82 3 38	3000
	Antares	E.	95 58 42	3077	94 30 4	3072	93 1 20	3067	91 32 30	3061
23	SUN	W.	72 16 34	3361	73 39 35	3352	75 2 46	3343	76 26 7	3333
	Spica	E.	38 22 26	3084	36 53 57	3082	35 25 25	3080	33 56 50	3078
	MARS	E.	74 31 28	2971	73 0 39	2964	71 29 41	2956	69 58 33	2948
	Antares	E.	84 6 26	3027	82 36 47	3019	81 6 58	3011	79 36 59	3002
24	SUN	W.	83 25 56	3978	84 50 33	3965	86 15 26	3952	87 40 32	3938
	Regulus	W.	28 48 27	2976	30 19 9	2961	31 50 10	2945	33 21 32	2929
	MARS	E.	62 20 17	2903	60 48 2	2893	59 15 35	2883	57 42 54	2872
	Antares	E.	72 4 8	2952	70 32 55	2941	69 1 29	2930	67 29 48	2918
25	SUN	W.	94 50 20	3165	96 17 11	3149	97 44 21	3133	99 11 50	3116
	Regulus	W.	41 3 23	2850	42 36 46	2834	44 10 30	2818	45 44 35	2801
	SATURN	W.	39 25 51	2869	40 58 49	2854	42 32 6	2838	44 5 45	2822
	MARS	E.	49 55 55	2814	48 21 46	2802	46 47 20	2789	45 12 38	2776
	Antares	E.	59 47 29	2854	58 14 12	2840	56 40 37	2826	55 6 44	2812
	α Aquilæ	E.	105 36 0	3618	104 17 45	3592	102 59 1	3567	101 39 51	3542
26	SUN	W.	106 34 30	3029	108 4 7	3011	109 34 8	2992	111 4 32	2973
	Regulus	W.	53 40 36	2714	55 16 57	2695	56 53 43	2677	58 30 52	2659
	SATURN	W.	51 59 22	2737	53 35 13	2720	55 11 28	2702	56 48 6	2684
	MARS	E.	37 14 58	2713	35 38 36	2701	34 1 58	2690	32 25 4	2679
	Antares	E.	47 12 39	2740	45 36 53	2725	44 0 47	2711	42 24 22	2697
	α Aquilæ	E.	94 57 33	3433	93 35 54	3413	92 13 52	3393	90 51 28	3375
27	SUN	W.	118 42 33	2874	120 15 25	2854	121 48 41	2834	123 22 23	2814
	Regulus	W.	66 42 52	2567	68 22 32	2548	70 2 39	2529	71 43 12	2510
	SATURN	W.	64 57 26	2591	66 36 33	2573	68 16 7	2554	69 56 6	2535
	Antares	E.	34 17 37	2631	32 39 25	2619	31 0 57	2608	29 22 15	2600
	α Aquilæ	E.	83 54 36	3297	82 30 21	3285	81 5 51	3273	79 41 8	3263
	JUPITER	E.	95 59 32	2532	94 19 4	2513	92 38 10	2494	90 56 49	2475
28	Regulus	W.	80 12 31	2416	81 55 43	2397	83 39 21	2379	85 23 25	2361
	SATURN	W.	78 22 38	2440	80 5 16	2421	81 48 20	2402	83 31 50	2384
	Spica	W.	26 41 27	2545	28 21 37	2512	30 2 33	2481	31 44 12	2453
	α Aquilæ	E.	72 34 59	3231	71 9 27	3230	69 43 54	3231	68 18 21	3234
	JUPITER	E.	82 23 33	2384	80 39 35	2365	78 55 10	2347	77 10 19	2329
29	Regulus	W.	94 10 16	2274	95 56 53	2258	97 43 56	2242	99 31 22	2226
	Spica	W.	40 21 56	2330	42 7 12	2309	43 52 58	2289	45 39 14	2269
	α Aquilæ	E.	61 12 38	3292	59 48 17	3313	58 24 21	3339	57 0 55	3370
	JUPITER	E.	68 19 35	2242	66 32 10	2226	64 44 21	2210	62 56 8	2194
	Fomalhaut	E.	90 32 6	2437	88 49 25	2421	87 6 20	2406	85 22 53	2391
30	Regulus	W.	108 34 14	2154	110 23 51	2140	112 13 48	2128	114 4 4	2116
	Spica	W.	54 37 23	2183	56 26 16	2168	58 15 31	2154	60 5 8	2141
	α Aquilæ	E.	50 14 41	3617	48 56 25	3690	47 39 28	3775	46 24 0	3870
	Fomalhaut	E.	76 40 38	2328	74 55 19	2319	73 9 46	2310	71 24 0	2301
	α Pegasi	E.	94 34 36	2558	92 54 42	2543	91 14 29	2529	89 33 57	2517

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Tues.	1	6 41 31.70	10.335	N.23 6 37.0	−10.25	15 46.18	68.78	3 33.42	0.478
Wed.	2	6 45 39.62	10.324	23 2 18.7	11.26	15 46.18	68.74	3 44.75	0.467
Thur.	3	6 49 47.27	10.312	22 57 36.3	12.26	15 46.18	68.70	3 55.81	0.455
Frid.	4	6 53 54.62	10.299	22 52 29.9	−13.26	15 46.18	68.66	4 6.58	0 442
Sat.	5	6 58 1.66	10.286	22 46 59.6	14.25	15 46.19	68.61	4 17.03	0.429
SUN.	6	7 2 8.38	10.272	22 41 5.6	15.23	15 46.20	68.56	4 27.16	0.415
Mon.	7	7 6 14.75	10.258	22 34 48.0	−16.21	15 46.21	68.51	4 36.95	0.401
Tues.	8	7 10 20.77	10.243	22 28 7.0	17.19	15 46.23	68.46	4 46.38	0.386
Wed.	9	7 14 26.40	10.227	22 21 2.7	18.16	15 46.25	68.40	4 55.43	0.370
Thur.	10	7 18 31.64	10.210	22 13 35.1	−19.12	15 46.27	68.34	5 4.10	0.353
Frid.	11	7 22 36.47	10.193	22 5 44.6	20.07	15 46.30	68.28	5 12 35	0.336
Sat.	12	7 26 40.88	10.175	21 57 31.3	21.02	15 46.34	68.22	5 20.18	0 318
SUN.	13	7 30 44.85	10.156	21 48 55.4	−21.96	15 46.38	68.15	5 27.57	0.299
Mon.	14	7 34 48.36	10.136	21 39 57.0	22.89	15 46.42	68.08	5 34.50	0.279
Tues.	15	7 38 51.38	10.116	21 30 36.5	23.81	15 46.47	68.01	5 40.95	0.259
Wed.	16	7 42 53.91	10.095	21 20 53.8	−24.72	15 46.53	67.94	5 46.91	0.238
Thur.	17	7 46 55.92	10.073	21 10 49.4	25.63	15 46.59	67.87	5 52.35	0.216
Frid.	18	7 50 57.41	10.051	21 0 23.5	26.52	15 46.66	67.80	5 57.26	0.194
Sat.	19	7 54 58.35	10.027	20 49 36.3	−27.40	15 46.73	67.72	6 1.63	0.171
SUN.	20	7 58 58.74	10.004	20 38 27.9	28.27	15 46.81	67.64	6 5.45	0.148
Mon.	21	8 2 58.55	9.980	20 26 58.7	29.14	15 46.89	67.56	6 8.70	0.124
Tues.	22	8 6 57.78	9.956	20 15 8.9	−29.99	15 46.98	67.48	6 11.36	0.100
Wed.	23	8 10 56.42	9.931	20 2 58.7	30.84	15 47.07	67.40	6 13.44	0.075
Thur.	24	8 14 54.46	9.906	19 50 28.5	31.67	15 47.17	67.32	6 14.92	0.050
Frid.	25	8 18 51.89	9.881	19 37 38.5	−32.49	15 47.27	67.23	6 15.80	0.025
Sat.	26	8 22 48.71	9.856	19 24 29.0	33.29	15 47.38	67.15	6 16.06	0.000
SUN.	27	8 26 44.92	9.830	19 11 0.2	34.09	15 47.48	67.06	6 15.71	0.026
Mon.	28	8 30 40.51	9.805	18 57 12.4	−34.87	15 47.59	66.98	6 14.74	0.051
Tues.	29	8 34 35.49	9.779	18 43 6.1	35.65	15 47.71	66.89	6 13.17	0.077
Wed.	30	8 38 29.85	9.754	18 28 41.3	36.41	15 47.83	66.81	6 10.99	0.102
Thur.	31	8 42 23.60	9.728	18 13 58.4	37.16	15 47.95	66.72	6 8.19	0.128
Frid.	32	8 46 16.74	9.702	N.17 58 57.5	−37.90	15 48.08	66.64	6 4.78	0.154

Note.—The mean time of semidiameter passing may be found by subtracting 0s.19 from the sidereal time.

The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Tues.	1	6 41 31.08	10.334	N. 23 6 37.6	−10.25	3 33.39	0.478	6 37 57.69
Wed.	2	6 45 38.97	10.323	23 2 19.4	11.26	3 44.72	0.467	6 41 54.25
Thur.	3	6 49 46.59	10.311	22 57 37.1	12.26	3 55.78	0.455	6 45 50.81
Frid.	4	6 53 53.91	10.298	22 52 30.8	−13.26	4 6.55	0.442	6 49 47.36
Sat.	5	6 58 0.92	10.285	22 47 0.6	14.25	4 17.00	0.429	6 53 43.92
SUN.	6	7 2 7.61	10.271	22 41 6.7	15.23	4 27.13	0.415	6 57 40.48
Mon.	7	7 6 13.96	10.257	22 34 49.2	−16.21	4 36.92	0.401	7 1 37.04
Tues.	8	7 10 19.95	10.242	22 28 8.3	17.19	4 46.35	0.386	7 5 33.60
Wed.	9	7 14 25.56	10.226	22 21 4.1	18.16	4 55.40	0.370	7 9 30.16
Thur.	10	7 18 30.78	10.209	22 13 36.7	−19.12	5 4.07	0.353	7 13 26.71
Frid.	11	7 22 35.59	10.192	22 5 46.3	20.07	5 12.32	0.336	7 17 23.27
Sat.	12	7 26 39.98	10.174	21 57 33.2	21.02	5 20.15	0.318	7 21 19.83
SUN.	13	7 30 43.93	10.155	21 48 57.4	−21.96	5 27.54	0.299	7 25 16.39
Mon.	14	7 34 47.42	10.135	21 39 59.2	22.89	5 34.48	0.279	7 29 12.94
Tues.	15	7 38 50.43	10.115	21 30 38.8	23.81	5 40.93	0.259	7 33 9.50
Wed.	16	7 42 52.94	10.094	21 20 56.3	−24.72	5 46.89	0.238	7 37 6.05
Thur.	17	7 46 54.94	10.072	21 10 52.0	25.63	5 52.33	0.216	7 41 2.61
Frid.	18	7 50 56.41	10.050	21 0 26.2	26.52	5 57.25	0.194	7 44 59.17
Sat.	19	7 54 57 34	10.027	20 49 39.1	−27.40	6 1.62	0.171	7 48 55.73
SUN.	20	7 58 57.72	10.004	20 38 30.8	28.27	6 5.44	0.148	7 52 52.28
Mon.	21	8 2 57.53	9.980	20 27 1.7	29.14	6 8.69	0.124	7 56 48.84
Tues.	22	8 6 56.75	9.956	20 15 12.0	−29.99	6 11.35	0.100	8 0 45.40
Wed.	23	8 10 55.39	9.931	20 3 1.9	30.84	6 13.43	0.075	8 4 41.96
Thur.	24	8 14 53.43	9.906	19 50 31.8	31.67	6 14.91	0.050	8 8 38.51
Frid.	25	8 18 50.86	9.881	19 37 41.9	−32.49	6 15.79	0.025	8 12 35.07
Sat.	26	8 22 47.68	9.856	19 24 32.5	33.29	6 16.06	0.000	8 16 31.62
SUN.	27	8 26 43.89	9.830	19 11 3.8	34.09	6 15.71	0.026	8 20 28.18
Mon.	28	8 30 39.49	9.805	18 57 16.1	−34.87	6 14.74	0.051	8 24 24.74
Tues.	29	8 34 34.47	9.779	18 43 9.8	35.65	6 13.17	0.077	8 28 21.30
Wed.	30	8 38 28.84	9.754	18 28 45.1	36.41	6 10.99	0.102	8 32 17.85
Thur.	31	8 42 22.60	9.728	18 14 2.2	37.16	6 8.20	0.128	8 36 14.41
Frid.	32	8 46 15.76	9.702	N. 17 59 1.4	−37.90	6 4.80	0.154	8 40 10.96

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing.

Diff. for 1 Hour
$+9^{s}.8565$.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	182	99 32 38.3	32 30.0	142.94	+ 0.03	0.0072014	+ 1.1	17 19 11.60
2	183	100 29 49.0	29 40.5	142.94	− 0.10	0.0072033	+ 0.4	17 15 15.68
3	184	101 26 59.6	26 50.9	142.94	0.23	0.0072036	− 0.2	17 11 19.77
4	185	102 24 10.3	24 1.4	142.95	− 0.34	0.0072024	− 0.6	17 7 23.86
5	186	103 21 21.2	21 12.1	142.96	0.42	0.0071998	1.4	17 3 27.95
6	187	104 18 32.3	18 23.1	142.97	0.47	0.0071957	2.0	16 59 32.04
7	188	105 15 43.7	15 34.4	142.98	− 0.50	0.0071900	− 2.7	16 55 36.13
8	189	106 12 55.5	12 46.0	143.00	0.49	0.0071825	3.5	16 51 40.22
9	190	107 10 7.8	9 58.1	143.02	0 45	0.0071731	4.3	16 47 44.31
10	191	108 7 20.6	7 10.7	143.04	− 0.39	0.0071617	− 5.2	16 43 48.39
11	192	109 4 33.9	4 23.8	143.06	0.31	0.0071481	6.1	16 39 52.48
12	193	110 1 47.8	1 37.5	143.08	0.20	0.0071323	7.1	16 35 56.57
13	194	110 59 2.2	58 51.7	143.10	− 0.08	0.0071142	− 8.1	16 32 0.66
14	195	111 56 17.1	56 6.5	143.12	+ 0.05	0.0070936	9.1	16 28 4.74
15	196	112 53 32.5	53 21.7	143.15	0.18	0.0070704	10.2	16 24 8.83
16	197	113 50 48.4	50 37.4	143.17	+ 0.30	0.0070446	−11.2	16 20 12.92
17	198	114 48 4.8	47 53.6	143.19	0.41	0.0070163	12.3	16 16 17.01
18	199	115 45 21.6	45 10.3	143.21	0.50	0.0069855	13.4	16 12 21.10
19	200	116 42 38.9	42 27.5	143.23	+ 0.57	0.0069521	−14.5	16 8 25.19
20	201	117 39 56.6	39 45.0	143.24	0.61	0.0069162	15.5	16 4 29.28
21	202	118 37 14.6	37 2.8	143.26	0.62	0 0068778	16.5	16 0 33.37
22	203	119 34 33.0	34 21.0	143.27	+ 0.60	0.0068371	−17.4	15 56 37.45
23	204	120 31 51.8	31 39.7	143.29	0.55	0.0067942	18.3	15 52 41.54
24	205	121 29 11.0	28 58.8	143.31	0.47	0.0067493	19.1	15 48 45.63
25	206	122 26 30.6	26 18.2	143.33	+ 0.37	0.0067024	−19.9	15 44 49.72
26	207	123 23 50.6	23 38.0	143.35	0.25	0.0066537	20.6	15 40 53.81
27	208	124 21 11.1	20 58.3	143.37	+ 0.11	0.0066033	21.3	15 36 57.90
28	209	125 18 32.2	18 19.3	143.39	− 0.02	0.0065514	−21.9	15 33 1.99
29	210	126 15 53.8	15 40.8	143.42	0.15	0.0064981	22.5	15 29 6.08
30	211	127 13 16.1	13 2.9	143.45	0.28	0.0064435	23.1	15 25 10.16
31	212	128 10 39.2	10 25.8	143.48	0.39	0.0063876	23.6	15 21 14.25
32	213	129 8 3.2	7 49.7	143.52	− 0.48	0.0063304	−24.1	15 17 18.34

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January $0^{d}.0$.

Diff. for 1 Hour,
— $9^{s}.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 30.1	16 34.6	60 27.3	+1.52	60 43.7	+1.20	11 25.7	2.65	14.1
2	16 38.0	16 40.1	60 56.0	0.84	61 3.9	+0.47	12 30.6	2.69	15.1
3	16 41.0	16 40.7	61 7.2	+0.08	61 5.8	−0.30	13 35.2	2.63	16.1
4	16 39.0	16 36.3	60 59.9	−0.67	60 49.7	−1.00	14 36.8	2.48	17.1
5	16 32.5	16 27.8	60 35.8	1.31	60 18.6	1.54	15 34.1	2.29	18.1
6	16 22.4	16 16.4	59 58.8	1.74	59 36.9	1.89	16 27.0	2.14	19.1
7	16 10.1	16 3.5	59 13.5	−1.99	58 49.2	−2.04	17 16.6	2.02	20.1
8	15 56.7	15 50.1	58 24.5	2.05	58 0.0	2.03	18 3.8	1.95	21.1
9	15 43.5	15 37.2	57 35.9	1.98	57 12.6	1.91	18 50.0	1.92	22.1
10	15 31.1	15 25.3	56 50.2	−1.81	56 29.1	−1.70	19 36.2	1.94	23.1
11	15 19.9	15 14.9	56 9.3	1.59	55 50.9	1.48	20 23.2	1.98	24.1
12	15 10.3	15 6.1	55 33.9	1.36	55 18.4	1.24	21 11.5	2.06	25.1
13	15 2.2	14 58.8	55 4.3	−1.12	54 51.6	−1.00	22 1.0	2.08	26.1
14	14 55.7	14 53.0	54 40.3	0.89	54 30.3	0.78	22 51.3	2.08	27.1
15	14 50.6	14 48.6	54 21.6	0.67	54 14.2	0.57	23 41.8	2.08	28.1
16	14 46.9	14 45.6	54 8.0	−0.46	54 3.1	−0.35	☌		29.1
17	14 44.6	14 44.0	53 59.5	0.25	53 57.3	−0.13	0 31.0	2.02	0.5
18	14 43.7	14 43.9	53 56.4	−0.01	53 56.9	+0.11	1 18.7	1.95	1.5
19	14 44.4	14 45.5	53 59.0	+0.25	54 2.7	+0.39	2 4.5	1.87	2.5
20	14 47.0	14 48.9	54 8.2	0.54	54 15.5	0.69	2 48.4	1.80	3.5
21	14 51.4	14 54.4	54 24.6	0.85	54 35.7	1.01	3 30.8	1.75	4.5
22	14 58.0	15 2.2	54 48.9	+1.19	55 4.2	+1.36	4 12.5	1.74	5.5
23	15 6.9	15 12.2	55 21.5	1.54	55 41.0	1.71	4 54.5	1.77	6.5
24	15 18.1	15 24.4	56 2.5	1.88	56 25.9	2.03	5 37.5	1.85	7.5
25	15 31.3	15 38.5	56 51.0	+2.16	57 17.6	+2.27	6 23.3	1.99	8.5
26	15 46.1	15 53.8	57 45.3	2.34	58 13.7	2.38	7 12.9	2.15	9.5
27	16 1.6	16 9.4	58 42.4	2.38	59 10.7	2.32	8 6.8	2.34	10.5
28	16 16.8	16 23.7	59 38.1	+2.21	60 3.7	+2.04	9 5.4	2.54	11.5
29	16 30.1	16 35.6	60 27.0	1.81	60 47.1	1.52	10 8.4	2.67	12.5
30	16 40.0	16 43.3	61 3.5	1.19	61 15.6	+0.81	11 13.4	2.69	13.5
31	16 45.3	16 45.9	61 22.9	+0.40	61 25.2	−0.03	12 17.5	2.60	14.5
32	16 45.2	16 43.0	61 22.4	−0.45	61 14.6	−0.85	13 18.3	2.45	15.5

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	17 34 45.82	2.6642	S. 23 21 28.5	5.009
1	17 37 25.84	2.6698	23 26 24.1	4.844
2	17 40 6.19	2.6753	23 31 9.8	4.677
3	17 42 46.87	2.6807	23 35 45.4	4.508
4	17 45 27.87	2.6858	23 40 10.8	4.338
5	17 48 9.17	2.6908	23 44 26.0	4.168
6	17 50 50.77	2.6958	23 48 31.0	3.997
7	17 53 32.67	2.7007	23 52 25.6	3.824
8	17 56 14.85	2.7053	23 56 9.8	3.649
9	17 58 57.30	2.7098	23 59 43.5	3.473
10	18 1 40.02	2.7142	24 3 6.6	3.296
11	18 4 23.00	2.7183	24 6 19.0	3.118
12	18 7 6.22	2.7223	24 9 20.7	2.939
13	18 9 49.68	2.7262	24 12 11.7	2.760
14	18 12 33.36	2.7298	24 14 51.9	2.579
15	18 15 17.26	2.7334	24 17 21.2	2.397
16	18 18 1.37	2.7366	24 19 39.6	2.215
17	18 20 45.67	2.7399	24 21 47.0	2.032
18	18 23 30.16	2.7429	24 23 43.5	1.849
19	18 26 14.82	2.7458	24 25 28.9	1.664
20	18 28 59.65	2.7484	24 27 3.2	1.478
21	18 31 44.63	2.7508	24 28 26.3	1.292
22	18 34 29.75	2.7532	24 29 38.3	1.106
23	18 37 15.01	2.7553	S. 24 30 39.0	0.919

WEDNESDAY 2.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	18 40 0.39	2.7572	S. 24 31 28.5	0.731
1	18 42 45.88	2.7589	24 32 6.7	0.544
2	18 45 31.46	2.7604	24 32 33.7	0.356
3	18 48 17.13	2.7617	24 32 49.4	− 0.167
4	18 51 2.87	2.7629	24 32 53.8	+ 0.022
5	18 53 48.68	2.7639	24 32 46.8	0.211
6	18 56 34.54	2.7647	24 32 28.5	0.400
7	18 59 20.44	2.7653	24 31 58.8	0.590
8	19 2 6.37	2.7657	24 31 17.7	0.779
9	19 4 52.32	2.7659	24 30 25.3	0.968
10	19 7 38.28	2.7659	24 29 21.5	1.157
11	19 10 24.23	2.7657	24 28 6.4	1.347
12	19 13 10.17	2.7654	24 26 39.9	1.536
13	19 15 56.08	2.7648	24 25 2.1	1.725
14	19 18 41.95	2.7641	24 23 12.9	1.914
15	19 21 27.77	2.7632	24 21 12.4	2.103
16	19 24 13.53	2.7621	24 19 0.6	2.291
17	19 26 59.22	2.7607	24 16 37.5	2.478
18	19 29 44.82	2.7592	24 14 3.2	2.665
19	19 32 30.33	2.7576	24 11 17.7	2.852
20	19 35 15.73	2.7558	24 8 21.0	3.038
21	19 38 1.02	2.7538	24 5 13.1	3.224
22	19 40 46.19	2.7516	24 1 54.1	3.409
23	19 43 31.21	2.7491	23 58 24.0	3.593
24	19 46 16.08	2.7465	S. 23 54 42.9	3.777

THURSDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	19 46 16.08	2.7465	S. 23 54 42.9	3.777
1	19 49 0.79	2.7438	23 50 50.8	3.959
2	19 51 45.34	2.7410	23 46 47.8	4.141
3	19 54 29.71	2.7379	23 42 33.9	4.322
4	19 57 13.89	2.7347	23 38 9.1	4.502
5	19 59 57.87	2.7313	23 33 33.6	4.681
6	20 2 41.65	2.7278	23 28 47.4	4.859
7	20 5 25.21	2.7241	23 23 50.5	5.037
8	20 8 8.54	2.7202	23 18 43.0	5.213
9	20 10 51.64	2.7162	23 13 25.0	5.388
10	20 13 34.49	2.7121	23 7 56.5	5.562
11	20 16 17.09	2.7077	23 2 17.6	5.733
12	20 18 59.42	2.7032	22 56 28.5	5.904
13	20 21 41.48	2.6987	22 50 29.1	6.075
14	20 24 23.27	2.6941	22 44 19.5	6.243
15	20 27 4.77	2.6893	22 37 59.9	6.410
16	20 29 45.98	2.6843	22 31 30.3	6.576
17	20 32 26.89	2.6792	22 24 50.8	6.741
18	20 35 7.49	2.6741	22 18 1.4	6.904
19	20 37 47.78	2.6688	22 11 2.3	7.065
20	20 40 27.74	2.6633	22 3 53.6	7.225
21	20 43 7.37	2.6578	21 56 35.3	7.383
22	20 45 46.66	2.6521	21 49 7.6	7.540
23	20 48 25.62	2.6464	S. 21 41 30.5	7.696

FRIDAY 4.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	20 51 4.23	2.6405	S. 21 33 44.1	7.849
1	20 53 42.48	2.6346	21 25 48.6	8.001
2	20 56 20.38	2.6287	21 17 44.0	8.152
3	20 58 57.92	2.6226	21 9 30.4	8.300
4	21 1 35.09	2.6163	21 1 8.0	8.447
5	21 4 11.88	2.6100	20 52 36.8	8.592
6	21 6 48.29	2.6037	20 43 56.9	8.736
7	21 9 24.32	2.5973	20 35 8.5	8.877
8	21 11 59.96	2.5908	20 26 11.7	9.017
9	21 14 35.22	2.5844	20 17 6.5	9.155
10	21 17 10.09	2.5778	20 7 53.1	9.291
11	21 19 44.56	2.5711	19 58 31.6	9.425
12	21 22 18.62	2.5644	19 49 2.1	9.557
13	21 24 52.28	2.5577	19 39 24.7	9.688
14	21 27 25.54	2.5509	19 29 39.5	9.817
15	21 29 58.39	2.5441	19 19 46.6	9.944
16	21 32 30.83	2.5372	19 9 46.2	10.068
17	21 35 2.85	2.5302	18 59 38.4	10.192
18	21 37 34.46	2.5233	18 49 23.2	10.313
19	21 40 5.65	2.5164	18 39 0.8	10.432
20	21 42 36.43	2.5095	18 28 31.3	10.549
21	21 45 6.79	2.5025	18 17 54.9	10.664
22	21 47 36.73	2.4955	18 7 11.6	10.777
23	21 50 6.25	2.4884	. 17 56 21.6	10.889
24	21 52 35.34	2.4813	S. 17 45 24.9	10.999

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 5.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	21 52 35.34	2.4813	S. 17 45 24.9	10.999
1	21 55 4.01	2.4743	17 34 21.7	11.107
2	21 57 32.26	2.4673	17 23 12.1	11.212
3	22 0 0.09	2.4603	17 11 56.3	11.315
4	22 2 27.50	2.4532	17 0 34.3	11.417
5	22 4 54.48	2.4462	16 49 6.2	11.517
6	22 7 21.04	2.4392	16 37 32.2	11.615
7	22 9 47.18	2.4322	16 25 52.4	11.711
8	22 12 12.90	2.4252	16 14 6.9	11.805
9	22 14 38.20	2.4182	16 2 15.8	11.897
10	22 17 3.09	2.4113	15 50 19.2	11.987
11	22 19 27.56	2.4043	15 38 17.3	12.075
12	22 21 51.61	2.3974	15 26 10.2	12.161
13	22 24 15.25	2.3906	15 13 58.0	12.246
14	22 26 38.48	2.3837	15 1 40.7	12.329
15	22 29 1.29	2.3768	14 49 18.5	12.409
16	22 31 23.69	2.3700	14 36 51.6	12.488
17	22 33 45.69	2.3632	14 24 20.0	12.565
18	22 36 7.28	2.3565	14 11 43.8	12.640
19	22 38 28.47	2.3498	13 59 3.2	12.713
20	22 40 49.26	2.3432	13 46 18.3	12.784
21	22 43 9.65	2.3366	13 33 29.1	12.854
22	22 45 29.65	2.3300	13 20 35.8	12.922
23	22 47 49.25	2.3234	S. 13 7 38.5	12.987

SUNDAY 6.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	22 50 8.46	2.3169	S. 12 54 37.4	13.050
1	22 52 27.28	2.3105	12 41 32.5	13.112
2	22 54 45.72	2.3042	12 28 23.9	13.173
3	22 57 3.78	2.2979	12 15 11.7	13.232
4	22 59 21.47	2.2917	12 1 56.1	13.288
5	23 1 38.79	2.2856	11 48 37.1	13.344
6	23 3 55.74	2.2794	11 35 14.8	13.397
7	23 6 12.32	2.2733	11 21 49.4	13.449
8	23 8 28.54	2.2673	11 8 20.9	13.499
9	23 10 44.40	2.2613	10 54 49.5	13.547
10	23 12 59.90	2.2553	10 41 15.3	13.593
11	23 15 15.04	2.2494	10 27 38.3	13.638
12	23 17 29.83	2.2437	10 13 58.7	13.681
13	23 19 44.28	2.2380	10 0 16.6	13.722
14	23 21 58.39	2.2324	9 46 32.0	13.763
15	23 24 12.17	2.2269	9 32 45.0	13.802
16	23 26 25.62	2.2214	9 18 55.8	13.838
17	23 28 38.74	2.2159	9 5 4.4	13.873
18	23 30 51.53	2.2105	8 51 11.0	13.907
19	23 33 4.00	2.2053	8 37 15.6	13.938
20	23 35 16.16	2.2001	8 23 18.4	13.968
21	23 37 28.01	2.1949	8 9 19.4	13.997
22	23 39 39.55	2.1898	7 55 18.7	14.025
23	23 41 50.79	2.1848	7 41 16.4	14.051
24	23 44 1.73	2.1799	S. 7 27 12.6	14.075

MONDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	23 44 1.73	2.1799	S. 7 27 12.6	14.075
1	23 46 12.38	2.1751	7 13 7.4	14.097
2	23 48 22.74	2.1703	6 59 0.9	14.119
3	23 50 32.81	2.1655	6 44 53.1	14.140
4	23 52 42.60	2.1609	6 30 44.1	14.158
5	23 54 52.12	2.1564	6 16 34.1	14.174
6	23 57 1.37	2.1519	6 2 23.2	14.189
7	23 59 10.35	2.1475	5 48 11.4	14.204
8	0 1 19.07	2.1432	5 33 58.7	14.217
9	0 3 27.54	2.1390	5 19 45.3	14.229
10	0 5 35.75	2.1348	5 5 31.2	14.239
11	0 7 43.71	2.1307	4 51 16.6	14.247
12	0 9 51.43	2.1267	4 37 1.5	14.255
13	0 11 58.91	2.1227	4 22 46.0	14.261
14	0 14 6.16	2.1189	4 8 30.2	14.266
15	0 16 13.18	2.1152	3 54 14.1	14.269
16	0 18 19.98	2.1115	3 39 57.9	14.272
17	0 20 26.56	2.1078	3 25 41.5	14.273
18	0 22 32.92	2.1042	3 11 25.1	14.272
19	0 24 39.07	2.1008	2 57 8.8	14.270
20	0 26 45.02	2.0975	2 42 52.7	14.268
21	0 28 50.77	2.0942	2 28 36.7	14.264
22	0 30 56.32	2.0909	2 14 21.0	14.258
23	0 33 1.68	2.0878	S. 2 0 5.7	14.252

TUESDAY 8.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	0 35 6.85	2.0847	S. 1 45 50.8	14.244
1	0 37 11.84	2.0817	1 31 36.4	14.236
2	0 39 16.66	2.0789	1 17 22.5	14.226
3	0 41 21.31	2.0761	1 3 9.3	14.214
4	0 43 25.79	2.0733	0 48 56.8	14.202
5	0 45 30.10	2.0705	0 34 45.1	14.188
6	0 47 34.25	2.0679	0 20 34.2	14.174
7	0 49 38.25	2.0654	S. 0 6 24.2	14.158
8	0 51 42.10	2.0630	N. 0 7 44.8	14.141
9	0 53 45.81	2.0607	0 21 52.7	14.123
10	0 55 49.38	2.0584	0 35 59.6	14.105
11	0 57 52.82	2.0562	0 50 5.3	14.084
12	0 59 56.12	2.0540	1 4 9.7	14.063
13	1 1 59.30	2.0520	1 18 12.8	14.041
14	1 4 2.36	2.0500	1 32 14.6	14.018
15	1 6 5.30	2.0481	1 46 15.0	13.994
16	1 8 8.13	2.0462	2 0 13.9	13.968
17	1 10 10.85	2.0444	2 14 11.2	13.942
18	1 12 13.46	2.0427	2 28 6.9	13.915
19	1 14 15.97	2.0411	2 42 1.0	13.887
20	1 16 18.39	2.0396	2 55 53.3	13.857
21	1 18 20.73	2.0382	3 9 43.8	13.826
22	1 20 22.98	2.0368	3 23 32.4	13.795
23	1 22 25.15	2.0354	3 37 19.2	13.763
24	1 24 27.23	2.0341	N. 3 51 4.0	13.730

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 9.					**FRIDAY 11.**				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	1 24 27.23	2.0341	N. 3 51 4.0	13.730	0	3 1 52.79	2.0469	N.13 54 48.7	11.107
1	1 26 29.24	2.0330	4 4 46.8	13.696	1	3 3 55.65	2.0484	14 5 52.9	11.033
2	1 28 31.19	2.0319	4 18 27.5	13.660	2	3 5 58.60	2.0500	14 16 52.6	10.958
3	1 30 33.07	2.0308	4 32 6.0	13.624	3	3 8 1.65	2.0516	14 27 47.8	10.882
4	1 32 34.89	2.0299	4 45 42.3	13.587	4	3 10 4.79	2.0532	14 38 38.4	10.805
5	1 34 36.66	2.0290	4 59 16.4	13.549	5	3 12 8.03	2.0548	14 49 24.4	10.728
6	1 36 38.37	2.0281	5 12 48.2	13.510	6	3 14 11.37	2.0565	15 0 5.8	10.651
7	1 38 40.03	2.0273	5 26 17.6	13.470	7	3 16 14.81	2.0582	15 10 42.5	10.572
8	1 40 41.65	2.0267	5 39 44.6	13.430	8	3 18 18.35	2.0599	15 21 14.4	10.492
9	1 42 43.24	2.0261	5 53 9.2	13.388	9	3 20 22.00	2.0617	15 31 41.6	10.412
10	1 44 44.79	2.0255	6 6 31.2	13.345	10	3 22 25.76	2.0635	15 42 3.9	10.331
11	1 46 46.30	2.0249	6 19 50.6	13.302	11	3 24 29.62	2.0653	15 52 21.3	10.249
12	1 48 47.78	2.0245	6 33 7.4	13.257	12	3 26 33.59	2.0671	16 2 33.8	10.167
13	1 50 49.24	2.0242	6 46 21.5	13.212	13	3 28 37.67	2.0690	16 12 41.3	10.084
14	1 52 50.68	2.0239	6 59 32.9	13.166	14	3 30 41.87	2.0709	16 22 43.9	10.001
15	1 54 52.11	2.0237	7 12 41.4	13.119	15	3 32 46.18	2.0728	16 32 41.5	9.917
16	1 56 53.52	2.0235	7 25 47.1	13.071	16	3 34 50.60	2.0747	16 42 34.0	9.832
17	1 58 54.93	2.0234	7 38 49.9	13.022	17	3 36 55.14	2.0767	16 52 21.3	9.746
18	2 0 56.33	2.0233	7 51 49.8	12.973	18	3 38 59.80	2.0787	17 2 3.5	9.660
19	2 2 57.73	2.0233	8 4 46.7	12.922	19	3 41 4.58	2.0807	17 11 40.5	9.572
20	2 4 59.13	2.0233	8 17 40.5	12.871	20	3 43 9.48	2.0827	17 21 12.2	9.484
21	2 7 0.53	2.0234	8 30 31.2	12.819	21	3 45 14.50	2.0847	17 30 38.6	9.396
22	2 9 1.94	2.0237	8 43 18.7	12.766	22	3 47 19.64	2.0867	17 39 59.7	9.307
23	2 11 3.37	2.0240	N. 8 56 3.1	12.712	23	3 49 24.90	2.0887	N.17 49 15.4	9.217
THURSDAY 10.					**SATURDAY 12.**				
0	2 13 4.82	2.0243	N. 9 8 44.2	12.657	0	3 51 30.29	2.0908	N.17 58 25.8	9.127
1	2 15 6.29	2.0247	9 21 22.0	12.602	1	3 53 35.80	2.0929	18 7 30.7	9.036
2	2 17 7.78	2.0250	9 33 56.4	12.546	2	3 55 41.44	2.0951	18 16 30.1	8.944
3	2 19 9.29	2.0254	9 46 27.5	12.489	3	3 57 47.21	2.0972	18 25 24.0	8.851
4	2 21 10.83	2.0260	9 58 55.1	12.431	4	3 59 53.10	2.0992	18 34 12.3	8.758
5	2 23 12.41	2.0267	10 11 19.2	12.372	5	4 1 59.11	2.1013	18 42 55.0	8.665
6	2 25 14.03	2.0273	10 23 39.7	12.312	6	4 4 5.25	2.1034	18 51 32.1	8.571
7	2 27 15.69	2.0280	10 35 56.6	12.252	7	4 6 11.52	2.1056	19 0 3.5	8.476
8	2 29 17.39	2.0287	10 48 9.9	12.192	8	4 8 17.92	2.1077	19 8 29.2	8.380
9	2 31 19.13	2.0294	11 0 19.6	12.130	9	4 10 24.44	2 1098	19 16 49.1	8.283
10	2 33 20.92	2.0303	11 12 25.5	12.067	10	4 12 31.09	2.1119	19 25 3.2	8.187
11	2 35 22.77	2.0312	11 24 27.6	12.003	11	4 14 37.87	2.1140	19 33 11.5	8.089
12	2 37 24.67	2.0322	11 36 25.8	11.938	12	4 16 44.77	2.1161	19 41 13.9	7.991
13	2 39 26.63	2.0332	11 48 20.1	11.873	13	4 18 51.80	2.1182	19 49 10.4	7.892
14	2 41 28.65	2.0342	12 0 10.5	11.808	14	4 20 58.96	2.1204	19 57 0.9	7.793
15	2 43 30.74	2.0353	12 11 57.0	11.742	15	4 23 6.25	2.1225	20 4 45.5	7.693
16	2 45 32.89	2.0364	12 23 39.5	11.674	16	4 25 13.66	2.1246	20 12 24.1	7.593
17	2 47 35.11	2.0376	12 35 17.9	11.605	17	4 27 21.20	2.1267	20 19 56.6	7.492
18	2 49 37.40	2.0388	12 46 52.1	11.536	18	4 29 28.87	2.1288	20 27 23.1	7.390
19	2 51 39.77	2.0401	12 58 22.2	11.467	19	4 31 36.66	2.1308	20 34 43.4	7.288
20	2 53 42.21	2.0414	13 9 48.1	11.396	20	4 33 44.57	2.1329	20 41 57.6	7.185
21	2 55 44.73	2.0427	13 21 9.7	11.325	21	4 35 52.61	2.1350	20 49 5.6	7.082
22	2 57 47.33	2.0441	13 32 27.1	11.253	22	4 38 0.77	2.1370	20 56 7.4	6.978
23	2 59 50.02	2.0455	13 43 40.1	11.180	23	4 40 9.05	2.1391	21 3 2.9	6.873
24	3 1 52.79	2.0469	N.13 54 48.7	11.107	24	4 42 17.46	2.1411	N.21 9 52.2	6.769

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	4 42 17.46	2.1411	N.21 9 52.2	6.769
1	4 44 25.98	2.1430	21 16 35.2	6.663
2	4 46 34.62	2.1450	21 23 11.8	6.557
3	4 48 43.38	2.1469	21 29 42.0	6.450
4	4 50 52.25	2.1488	21 36 5.8	6.343
5	4 53 1.24	2.1508	21 42 23.2	6.236
6	4 55 10.35	2.1527	21 48 34.1	6.128
7	4 57 19.57	2.1545	21 54 38.5	6.019
8	4 59 28.89	2.1563	22 0 36.4	5.911
9	5 1 38.32	2.1581	22 6 27.8	5.802
10	5 3 47.86	2.1598	22 12 12.6	5.692
11	5 5 57.50	2.1616	22 17 50.8	5.581
12	5 8 7.25	2.1633	22 23 22.3	5.470
13	5 10 17.10	2.1650	22 28 47.2	5.359
14	5 12 27.05	2.1666	22 34 5.4	5.248
15	5 14 37.09	2.1682	22 39 16.9	5.136
16	5 16 47.23	2.1698	22 44 21.7	5.023
17	5 18 57.46	2.1713	22 49 19.7	4.910
18	5 21 7.79	2.1728	22 54 10.9	4.797
19	5 23 18.20	2.1743	22 58 55.3	4.683
20	5 25 28.70	2.1757	23 3 32.9	4.570
21	5 27 39.28	2.1770	23 8 3.7	4.456
22	5 29 49.94	2.1783	23 12 27.6	4.341
23	5 32 0.68	2.1796	N.23 16 44.6	4.227

MONDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	5 34 11.50	2.1809	N.23 20 54.8	4.112
1	5 36 22.39	2.1821	23 24 58.0	3.995
2	5 38 33.35	2.1832	23 28 54.2	3.879
3	5 40 44.38	2.1843	23 32 43.5	3.763
4	5 42 55.47	2.1854	23 36 25.8	3.647
5	5 45 6.63	2.1865	23 40 1.1	3.530
6	5 47 17.85	2.1874	23 43 29.4	3.413
7	5 49 29.12	2.1883	23 46 50.7	3.296
8	5 51 40.44	2.1892	23 50 4.9	3.178
9	5 53 51.82	2.1900	23 53 12.1	3.061
10	5 56 3.24	2.1907	23 56 12.2	2.943
11	5 58 14.70	2.1914	23 59 5.2	2.825
12	6 0 26.21	2.1921	24 1 51.2	2.707
13	6 2 37.75	2.1927	24 4 30.1	2.588
14	6 4 49.33	2.1932	24 7 1.8	2.469
15	6 7 0.94	2.1937	24 9 26.4	2.351
16	6 9 12.58	2.1942	24 11 43.9	2.232
17	6 11 24.24	2.1945	24 13 54.3	2.113
18	6 13 35.92	2.1948	24 15 57.5	1.994
19	6 15 47.62	2.1951	24 17 53.6	1.875
20	6 17 59.33	2.1953	24 19 42.5	1.756
21	6 20 11.05	2.1954	24 21 24.3	1.637
22	6 22 22.78	2.1955	24 22 58.9	1.517
23	6 24 34.51	2.1956	24 24 26.3	1.397
24	6 26 46.25	2.1956	N.24 25 46.6	1.278

TUESDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	6 26 46.25	2.1956	N.24 25 46.6	1.278
1	6 28 57.98	2.1954	24 26 59.7	1.158
2	6 31 9.70	2.1953	24 28 5.6	1.039
3	6 33 21.42	2.1951	24 29 4.4	0.920
4	6 35 33.12	2.1948	24 29 56.0	0.800
5	6 37 44.80	2.1944	24 30 40.4	0.680
6	6 39 56.45	2.1940	24 31 17.6	0.561
7	6 42 8.08	2.1936	24 31 47.7	0.442
8	6 44 19.68	2.1932	24 32 10.6	0.322
9	6 46 31.26	2.1926	24 32 26.4	0.203
10	6 48 42.80	2.1919	24 32 35.0	+ 0.084
11	6 50 54.29	2.1912	24 32 36.5	− 0.034
12	6 53 5.74	2.1905	24 32 30.9	0.153
13	6 55 17.15	2.1897	24 32 18.1	0.272
14	6 57 28.50	2.1888	24 31 58.2	0.391
15	6 59 39.80	2.1878	24 31 31.2	0.509
16	7 1 51.04	2.1868	24 30 57.1	0.628
17	7 4 2.22	2.1858	24 30 15.9	0.746
18	7 6 13.34	2.1847	24 29 27.6	0.863
19	7 8 24.39	2.1835	24 28 32.3	0.981
20	7 10 35.36	2.1823	24 27 29.9	1.099
21	7 12 46.26	2.1810	24 26 20.4	1.216
22	7 14 57.08	2.1797	24 25 3.9	1.333
23	7 17 7.82	2.1783	N.24 23 40.4	1.450

WEDNESDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	7 19 18.48	2.1769	N.24 22 9.9	1.567
1	7 21 29.05	2.1754	24 20 32.4	1.683
2	7 23 39.52	2.1738	24 18 47.9	1.799
3	7 25 49.90	2.1722	24 16 56.5	1.914
4	7 28 0.18	2.1705	24 14 58.2	2.029
5	7 30 10.36	2.1687	24 12 53.0	2.145
6	7 32 20.43	2.1669	24 10 40.8	2.260
7	7 34 30.39	2.1651	24 8 21.8	2.374
8	7 36 40.24	2.1632	24 5 56.0	2.488
9	7 38 49.98	2.1613	24 3 23.3	2.602
10	7 40 59.60	2.1593	24 0 43.8	2.715
11	7 43 9.10	2.1573	23 57 57.5	2.827
12	7 45 18.48	2.1552	23 55 4.5	2.940
13	7 47 27.73	2.1531	23 52 4.7	3.052
14	7 49 36.85	2.1509	23 48 58.2	3.163
15	7 51 45.84	2.1487	23 45 45.1	3.274
16	7 53 54.69	2.1464	23 42 25.3	3.386
17	7 56 3.40	2.1441	23 38 58.8	3.497
18	7 58 11.98	2.1417	23 35 25.7	3.606
19	8 0 20.41	2.1393	23 31 46.1	3.715
20	8 2 28.70	2.1369	23 27 59.9	3.824
21	8 4 36.84	2.1344	23 24 7.2	3.933
22	8 6 44.83	2.1319	23 20 8.0	4.041
23	8 8 52.67	2.1294	23 16 2.3	4.148
24	8 11 0.36	2.1268	N.23 11 50.2	4.255

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 17.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	8 11 0.36	2.1268	N.23 11 50.2	4.255
1	8 13 7.89	2.1242	23 7 31.7	4.362
2	8 15 15.26	2.1215	23 3 6.8	4.468
3	8 17 22.47	2.1187	22 58 35.6	4.573
4	8 19 29.51	2.1160	22 53 58.1	4.678
5	8 21 36.39	2.1132	22 49 14.3	4.783
6	8 23 43.10	2.1104	22 44 24.2	4.886
7	8 25 49.64	2.1076	22 39 28.0	4.989
8	8 27 56.01	2.1047	22 34 25.6	5.092
9	8 30 2.21	2.1019	22 29 17.0	5.194
10	8 32 8.24	2.0990	22 24 2.3	5.295
11	8 34 14.09	2.0960	22 18 41.6	5.396
12	8 36 19.76	2.0930	22 13 14.8	5.497
13	8 38 25.25	2.0900	22 7 42.0	5.596
14	8 40 30.56	2.0871	22 2 3.3	5.695
15	8 42 35.70	2.0841	21 56 18.6	5.794
16	8 44 40.65	2.0810	21 50 28.0	5.892
17	8 46 45.42	2.0780	21 44 31.6	5.989
18	8 48 50.01	2.0749	21 38 29.4	6.085
19	8 50 54.41	2.0718	21 32 21.4	6.181
20	8 52 58.62	2.0687	21 26 7.7	6.276
21	8 55 2.65	2.0656	21 19 48.3	6.371
22	8 57 6.49	2.0624	21 13 23.2	6.466
23	8 59 10.14	2.0592	N.21 6 52.4	6.560

FRIDAY 18.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	9 1 13.60	2.0561	N.21 0 16.0	6.652
1	9 3 16.87	2.0529	20 53 34.1	6.744
2	9 5 19.95	2.0498	20 46 46.7	6.835
3	9 7 22.84	2.0466	20 39 53.9	6.926
4	9 9 25.54	2.0433	20 32 55.6	7.017
5	9 11 28.04	2.0401	20 25 51.9	7.106
6	9 13 30.35	2.0369	20 18 42.9	7.194
7	9 15 32.47	2.0337	20 11 28.6	7.283
8	9 17 34.40	2.0305	20 4 9.0	7.371
9	9 19 36.13	2.0273	19 56 44.1	7.457
10	9 21 37.67	2.0241	19 49 14.1	7.542
11	9 23 39.02	2.0208	19 41 39.0	7.628
12	9 25 40.17	2.0176	19 33 58.7	7.713
13	9 27 41.13	2.0144	19 26 13.4	7.797
14	9 29 41.90	2.0112	19 18 23.1	7.880
15	9 31 42.48	2.0081	19 10 27.8	7.963
16	9 33 42.87	2.0049	19 2 27.5	8.046
17	9 35 43.07	2.0017	18 54 22.3	8.127
18	9 37 43.08	1.9986	18 46 12.3	8.207
19	9 39 42.90	1.9954	18 37 57.5	8.287
20	9 41 42.53	1.9922	18 29 37.9	8.366
21	9 43 41.97	1.9891	18 21 13.6	8.444
22	9 45 41.22	1.9860	18 12 44.6	8.522
23	9 47 40.29	1.9829	18 4 10.9	8.600
24	9 49 39.17	1.9798	N.17 55 32.6	8.676

SATURDAY 19.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	9 49 39.17	1.9798	N.17 55 32.6	8.676
1	9 51 37.87	1.9767	17 46 49.8	8.751
2	9 53 36.38	1.9737	17 38 2.5	8.826
3	9 55 34.71	1.9707	17 29 10.7	8.901
4	9 57 32.86	1.9677	17 20 14.4	8.975
5	9 59 30.83	1.9647	17 11 13.7	9.047
6	10 1 28.62	1.9617	17 2 8.7	9.119
7	10 3 26.23	1.9587	16 52 59.4	9.191
8	10 5 23.67	1.9558	16 43 45.8	9.262
9	10 7 20.93	1.9529	16 34 28.0	9.332
10	10 9 18.02	1.9501	16 25 6.0	9.401
11	10 11 14.94	1.9472	16 15 39.9	9.470
12	10 13 11.68	1.9443	16 6 9.6	9.538
13	10 15 8.25	1.9415	15 56 35.3	9.605
14	10 17 4.66	1.9388	15 46 57.0	9.672
15	10 19 0.91	1.9361	15 37 14.7	9.738
16	10 20 56.99	1.9333	15 27 28.5	9.803
17	10 22 52.91	1.9306	15 17 38.4	9.868
18	10 24 48.66	1.9279	15 7 44.4	9.932
19	10 26 44.26	1.9253	14 57 46.6	9.994
20	10 28 39.70	1.9227	14 47 45.1	10 056
21	10 30 34.99	1.9202	14 37 39.8	10.118
22	10 32 30.13	1.9177	14 27 30.9	10.179
23	10 34 25.12	1.9152	N.14 17 18.3	10.240

SUNDAY 20.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	10 36 19.96	1.9128	N.14 7 2.1	10.300
1	10 38 14.66	1.9104	13 56 42.3	10.359
2	10 40 9.21	1.9080	13 46 19.0	10.417
3	10 42 3.62	1 9057	13 35 52.3	10.474
4	10 43 57.89	1.9034	13 25 22.1	10.531
5	10 45 52.03	1.9012	13 14 48.5	10.588
6	10 47 46.03	1.8989	13 4 11.6	10.643
7	10 49 39.90	1.8967	12 53 31.4	10.698
8	10 51 33.64	1.8946	12 42 47.9	10.753
9	10 53 27.26	1.8926	12 32 1.1	10.807
10	10 55 20.75	1.8905	12 21 11.1	10.859
11	10 57 14.12	1.8885	12 10 18.0	10.910
12	10 59 7.37	1.8866	11 59 21.9	10.961
13	11 1 0.51	1.8847	11 48 22.7	11.012
14	11 2 53.53	1.8828	11 37 20.4	11.063
15	11 4 46.44	1.8809	11 26 15.1	11.113
16	11 6 39.24	1.8792	11 15 6.8	11.162
17	11 8 31.94	1.8775	11 3 55.7	11.209
18	11 10 24.54	1.8758	10 52 41.7	11.256
19	11 12 17.04	1.8742	10 41 24.9	11.303
20	11 14 9.44	1.8726	10 30 5.3	11.350
21	11 16 1.75	1.8711	10 18 42.9	11.396
22	11 17 53.97	1.8697	10 7 17.8	11.441
23	11 19 46.11	1.8682	9 55 50.0	11.486
24	11 21 38.16	1.8668	N. 9 44 19.6	11.528

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	11 21 38.16	1.8668	N. 9 44 19.6	11.528
1	11 23 30.13	1.8655	9 32 46.6	11.571
2	11 25 22.02	1.8643	9 21 11.1	11.613
3	11 27 13.84	1.8631	9 9 33.1	11.654
4	11 29 5.59	1.8619	8 57 52.6	11.696
5	11 30 57.27	1.8608	8 46 9.6	11.737
6	11 32 48.88	1.8597	8 34 24.2	11.776
7	11 34 40.43	1.8587	8 22 36.5	11.814
8	11 36 31.93	1.8578	8 10 46.5	11.853
9	11 38 23.37	1.8569	7 58 54.2	11.891
10	11 40 14.76	1.8561	7 46 59.6	11.927
11	11 42 6.10	1.8553	7 35 2.9	11.963
12	11 43 57.39	1.8545	7 23 4.0	11.999
13	11 45 48.64	1.8539	7 11 3.0	12.034
14	11 47 39.86	1.8533	6 58 59.9	12.068
15	11 49 31.04	1.8528	6 46 54.8	12.102
16	11 51 22.19	1.8523	6 34 47.7	12.135
17	11 53 13.32	1.8519	6 22 38.6	12.167
18	11 55 4.42	1.8515	6 10 27.6	12.199
19	11 56 55.50	1.8512	5 58 14.7	12.230
20	11 58 46.57	1.8510	5 46 0.0	12.261
21	12 0 37.62	1.8508	5 33 43.4	12.291
22	12 2 28.67	1.8507	5 21 25.1	12.319
23	12 4 19.71	1.8507	N. 5 9 5.1	12.348

TUESDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	12 6 10.75	1.8507	N. 4 56 43.4	12.376
1	12 8 1.79	1.8508	4 44 20.0	12.403
2	12 9 52.84	1.8509	4 31 55.1	12.428
3	12 11 43.90	1.8510	4 19 28.6	12.454
4	12 13 34.97	1.8513	4 7 0.6	12.479
5	12 15 26.06	1.8517	3 54 31.1	12.504
6	12 17 17.17	1.8521	3 42 0.1	12.528
7	12 19 8.31	1.8526	3 29 27.7	12.551
8	12 20 59.48	1.8531	3 16 54.0	12.574
9	12 22 50.68	1.8537	3 4 18.9	12.596
10	12 24 41.92	1.8543	2 51 42.5	12.617
11	12 26 33.20	1.8551	2 39 4.9	12.636
12	12 28 24.53	1.8559	2 26 26.2	12.655
13	12 30 15.91	1.8568	2 13 46.3	12.674
14	12 32 7.34	1.8577	2 1 5.3	12.693
15	12 33 58.83	1.8587	1 48 23.2	12.711
16	12 35 50.38	1.8597	1 35 40.0	12.728
17	12 37 42.00	1.8608	1 22 55.8	12.745
18	12 39 33.68	1.8620	1 10 10.6	12.761
19	12 41 25.44	1.8633	0 57 24.5	12.775
20	12 43 17.28	1.8647	0 44 37.6	12.788
21	12 45 9.20	1.8661	0 31 49.9	12.801
22	12 47 1.21	1.8676	0 19 1.4	12.814
23	12 48 53.31	1.8691	N. 0 6 12.2	12.826
24	12 50 45.50	1.8707	S. 0 6 37.7	12.837

WEDNESDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	12 50 45.50	1.8707	S. 0 6 37.7	12.837
1	12 52 37.79	1.8724	0 19 28.3	12.848
2	12 54 30.19	1.8742	0 32 19.5	12.858
3	12 56 22.70	1.8761	0 45 11.2	12.867
4	12 58 15.32	1.8780	0 58 3.5	12.875
5	13 0 8.06	1.8799	1 10 56.2	12.883
6	13 2 0.91	1.8819	1 23 49.4	12.890
7	13 3 53.89	1.8841	1 36 43.0	12.896
8	13 5 47.00	1.8863	1 49 36.9	12.901
9	13 7 40.25	1.8886	2 2 31.1	12.906
10	13 9 33.64	1.8910	2 15 25.6	12.909
11	13 11 27.17	1.8934	2 28 20.2	12.912
12	13 13 20.84	1.8958	2 41 15.0	12.914
13	13 15 14.67	1.8985	2 54 9.9	12.916
14	13 17 8.66	1.9012	3 7 4.9	12.917
15	13 19 2.81	1.9039	3 19 59.9	12.916
16	13 20 57.12	1.9066	3 32 54.8	12.915
17	13 22 51.60	1.9095	3 45 49.7	12.913
18	13 24 46.26	1.9125	3 58 44.4	12.910
19	13 26 41.10	1.9155	4 11 38.9	12.907
20	13 28 36.12	1.9186	4 24 33.2	12.903
21	13 30 31.33	1.9217	4 37 27.3	12.898
22	13 32 26.73	1.9250	4 50 21.0	12.892
23	13 34 22.33	1.9283	S. 5 3 14.3	12.884

THURSDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	13 36 18.13	1.9317	S. 5 16 7.1	12.876
1	13 38 14.14	1.9352	5 28 59.4	12.867
2	13 40 10.36	1.9388	5 41 51.2	12.858
3	13 42 6.80	1.9425	5 54 42.4	12.848
4	13 44 3.46	1.9462	6 7 33.0	12.837
5	13 46 0.34	1.9499	6 20 22.9	12.825
6	13 47 57.45	1.9537	6 33 12.0	12.812
7	13 49 54.79	1.9577	6 46 0.3	12.797
8	13 51 52.38	1.9618	6 58 47.7	12.782
9	13 53 50.21	1.9659	7 11 34.1	12.765
10	13 55 48.29	1.9701	7 24 19.5	12.748
11	13 57 46.62	1.9743	7 37 3.9	12.731
12	13 59 45.21	1.9787	7 49 47.3	12.713
13	14 1 44.06	1.9831	8 2 29.5	12.692
14	14 3 43.18	1.9876	8 15 10.4	12.671
15	14 5 42.57	1.9921	8 27 50.0	12.649
16	14 7 42.23	1.9968	8 40 28.3	12.627
17	14 9 42.18	2.0015	8 53 5.2	12.603
18	14 11 42.41	2.0063	9 5 40.6	12.578
19	14 13 42.93	2.0112	9 18 14.5	12.552
20	14 15 43.75	2.0162	9 30 46.8	12.524
21	14 17 44.87	2.0212	9 43 17.4	12.496
22	14 19 46.29	2.0262	9 55 46.3	12.467
23	14 21 48.01	2.0313	10 8 13.4	12.436
24	14 23 50.04	2.0365	S. 10 20 38.6	12.404

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 25.					**SUNDAY 27.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	14 23 50.04	2.0365	S. 10 20 38.6	12.404	0	16 8 55.07	2.3629	S. 19 15 27.4	9.329
1	14 25 52.39	2.0419	10 33 1.9	12.372	1	16 11 17.08	2.3707	19 24 44.1	9.227
2	14 27 55.07	2.0473	10 45 23.2	12.338	2	16 13 39.56	2.3786	19 33 54.7	9.124
3	14 29 58.07	2.0528	10 57 42.5	12.303	3	16 16 2.51	2.3865	19 42 59.0	9.019
4	14 32 1.40	2.0583	11 9 59.6	12.267	4	16 18 25.94	2.3944	19 51 57.0	8.912
5	14 34 5.07	2.0640	11 22 14.5	12.229	5	16 20 49.84	2.4022	20 0 48.5	8.803
6	14 36 9.08	2.0697	11 34 27.1	12.191	6	16 23 14.21	2.4101	20 9 33.4	8.693
7	14 38 13.43	2.0754	11 46 37.4	12.152	7	16 25 39.05	2.4179	20 18 11.7	8.582
8	14 40 18.13	2.0812	11 58 45.3	12.110	8	16 28 4.36	2.4257	20 26 43.2	8.468
9	14 42 23.18	2.0872	12 10 50.6	12.068	9	16 30 30.14	2.4336	20 35 7.9	8.353
10	14 44 28.59	2.0932	12 22 53.4	12.025	10	16 32 56.39	2.4414	20 43 25.6	8.236
11	14 46 34.36	2.0992	12 34 53.6	11.981	11	16 35 23.11	2.4493	20 51 36.2	8.117
12	14 48 40.49	2.1053	12 46 51.1	11.935	12	16 37 50.30	2.4571	20 59 39.6	7.996
13	14 50 46.99	2.1115	12 58 45.8	11.887	13	16 40 17.96	2.4648	21 7 35.7	7.874
14	14 52 53.87	2.1177	13 10 37.6	11.838	14	16 42 46.08	2.4725	21 15 24.5	7.751
15	14 55 1.12	2.1240	13 22 26.4	11.788	15	16 45 14.66	2.4803	21 23 5.8	7.625
16	14 57 8.75	2.1304	13 34 12.2	11.737	16	16 47 43.71	2.4880	21 30 39.5	7.498
17	14 59 16.77	2.1369	13 45 54.9	11.685	17	16 50 13.22	2.4956	21 38 5.6	7.369
18	15 1 25.18	2.1434	13 57 34.4	11.632	18	16 52 43.18	2.5032	21 45 23.8	7.238
19	15 3 33.98	2.1500	14 9 10.7	11.577	19	16 55 13.60	2.5107	21 52 34.1	7.106
20	15 5 43.18	2.1567	14 20 43.6	11.520	20	16 57 44.47	2.5182	21 59 36.5	6.972
21	15 7 52.78	2.1634	14 32 13.1	11.462	21	17 0 15.79	2.5257	22 6 30.8	6.836
22	15 10 2.78	2.1701	14 43 39.0	11.402	22	17 2 47.55	2.5331	22 13 16.9	6.698
23	15 12 13.19	2.1770	S. 14 55 1.3	11.342	23	17 5 19.76	2.5405	S. 22 19 54.6	6.558
	SATURDAY 26.					**MONDAY 28.**			
0	15 14 24.02	2.1839	S. 15 6 20.0	11.280	0	17 7 52.41	2.5478	S. 22 26 23.9	6.418
1	15 16 35.26	2.1908	15 17 34.9	11.216	1	17 10 25.50	2.5551	22 32 44.7	6.276
2	15 18 46.92	2.1978	15 28 45.9	11.151	2	17 12 59.02	2.5622	22 38 57.0	6.132
3	15 20 59.00	2.2049	15 39 53.0	11.085	3	17 15 32.96	2.5693	22 45 0.5	5.985
4	15 23 11.51	2.2120	15 50 56.1	11.017	4	17 18 7.33	2.5763	22 50 55.2	5.838
5	15 25 24.44	2.2191	16 1 55.0	10.947	5	17 20 42.12	2.5832	22 56 41.1	5.690
6	15 27 37.80	2.2264	16 12 49.7	10.876	6	17 23 17.32	2.5901	23 2 18.0	5.539
7	15 29 51.60	2.2337	16 23 40.1	10.803	7	17 25 52.93	2.5969	23 7 45.8	5.387
8	15 32 5.84	2.2410	16 34 26.1	10.729	8	17 28 28.95	2.6037	23 13 4.4	5.233
9	15 34 20.52	2.2483	16 45 7.6	10.653	9	17 31 5.37	2.6103	23 18 13.8	5.079
10	15 36 35.64	2.2557	16 55 44.5	10.577	10	17 33 42.18	2.6167	23 23 13.9	4.922
11	15 38 51.20	2.2631	17 6 16.8	10.498	11	17 36 19.37	2.6230	23 28 4.4	4.762
12	15 41 7.21	2.2706	17 16 44.3	10.418	12	17 38 56.94	2.6293	23 32 45.3	4.602
13	15 43 23.67	2.2782	17 27 6.9	10.336	13	17 41 34.89	2.6356	23 37 16.6	4.442
14	15 45 40.59	2.2857	17 37 24.6	10.253	14	17 44 13.21	2.6416	23 41 38.3	4.280
15	15 47 57.96	2.2933	17 47 37.2	10.168	15	17 46 51.88	2.6475	23 45 50.2	4.116
16	15 50 15.79	2.3010	17 57 44.7	10.081	16	17 49 30.91	2.6534	23 49 52.2	3.950
17	15 52 34.08	2.3086	18 7 46.9	9.992	17	17 52 10.29	2.6592	23 53 44.2	3.783
18	15 54 52.82	2.3163	18 17 43.8	9.902	18	17 54 50.01	2.6648	23 57 26.2	3.616
19	15 57 12.03	2.3240	18 27 35.2	9.811	19	17 57 30.07	2.6702	24 0 58.1	3.447
20	15 59 31.70	2.3318	18 37 21.1	9.718	20	18 0 10.44	2.6754	24 4 19.8	3.276
21	16 1 51.84	2.3396	18 47 1.4	9.623	21	18 2 51.12	2.6806	24 7 31.2	3.104
22	16 4 12.45	2.3474	18 56 35.9	9.527	22	18 5 32.11	2.6857	24 10 32.3	2.932
23	16 6 33.53	2.3552	19 6 4.6	9.429	23	18 8 13.41	2.6907	24 13 23.0	2.758
24	16 8 55.07	2.3629	S. 19 15 27.4	9.329	24	18 10 55.00	2.6955	S. 24 16 3.2	2.582

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	18 10 55.00	2.6955	S.24 16 3.2	2.582
1	18 13 36.87	2.7001	24 18 32.8	2.405
2	18 16 19.01	2.7046	24 20 51.8	2.228
3	18 19 1.42	2.7069	24 23 0.2	2.051
4	18 21 44.08	2.7130	24 24 57.9	1.872
5	18 24 26.98	2.7170	24 26 44.8	1.692
6	18 27 10.12	2.7209	24 28 20.9	1.511
7	18 29 53.49	2.7246	24 29 46.1	1.328
8	18 32 37.07	2.7281	24 31 0.3	1.145
9	18 35 20.86	2.7314	24 32 3.5	0.962
10	18 38 4.84	2.7346	24 32 55.7	0.778
11	18 40 49.01	2.7377	24 33 36.9	0.593
12	18 43 33.36	2.7405	24 34 6.9	0.407
13	18 46 17.87	2.7431	24 34 25.8	0.222
14	18 49 2.53	2.7456	24 34 33.5	− 0.036
15	18 51 47.34	2.7479	24 34 30.1	+ 0.151
16	18 54 32.28	2.7500	24 34 15.4	0.339
17	18 57 17.34	2.7520	24 33 49.4	0.527
18	19 0 2.52	2.7538	24 33 12.1	0.716
19	19 2 47.80	2.7553	24 32 23.5	0.904
20	19 5 33.16	2.7567	24 31 23.6	1.093
21	19 8 18.60	2.7579	24 30 12.4	1.282
22	19 11 4.11	2.7589	24 28 49.8	1.472
23	19 13 49.67	2.7597	S.24 27 15.8	1.661

WEDNESDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	19 16 35.28	2.7604	S.24 25 30.5	1.850
1	19 19 20.92	2.7608	24 23 33.8	2.039
2	19 22 6.58	2.7612	24 21 25.8	2.228
3	19 24 52.26	2.7613	24 19 6.4	2.418
4	19 27 37.94	2.7612	24 16 35.6	2.607
5	19 30 23.61	2.7609	24 13 53.5	2.796
6	19 33 9.25	2.7604	24 11 0.1	2.984
7	19 35 54.86	2.7598	24 7 55.4	3.173
8	19 38 40.43	2.7591	24 4 39.4	3.361
9	19 41 25.95	2.7581	24 1 12.1	3.548
10	19 44 11.40	2.7568	23 57 33.6	3.735
11	19 46 56.77	2.7555	23 53 43.9	3.922
12	19 49 42.06	2.7540	23 49 43.0	4.107
13	19 52 27.25	2.7522	23 45 31.0	4.292
14	19 55 12.33	2.7504	23 41 7.9	4.477
15	19 57 57.30	2.7484	23 36 33.7	4.662
16	20 0 42.14	2.7462	23 31 48.5	4.845
17	20 3 26.84	2.7438	23 26 52.3	5.027
18	20 6 11.39	2.7413	23 21 45.2	5.209
19	20 8 55.79	2.7386	23 16 27.2	5.390
20	20 11 40.02	2.7357	23 10 58.4	5.569
21	20 14 24.07	2.7327	23 5 18.9	5.748
22	20 17 7.94	2.7295	22 59 28.7	5.926
23	20 19 51.61	2.7261	22 53 27.8	6.103
24	20 22 35.07	2.7226	S.22 47 16.3	6.279

THURSDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	20 22 35.07	2.7226	S.22 47 16.3	6.279
1	20 25 18.32	2.7190	22 40 54.3	6.453
2	20 28 1.35	2.7152	22 34 21.9	6.626
3	20 30 44.15	2.7113	22 27 39.2	6.797
4	20 33 26.71	2.7073	22 20 46.2	6.968
5	20 36 9.03	2.7032	22 13 43.0	7.138
6	20 38 51.09	2.6988	22 6 29.6	7.307
7	20 41 32.89	2.6944	21 59 6.2	7.473
8	20 44 14.42	2.6898	21 51 32.9	7.638
9	20 46 55.67	2.6852	21 43 49.7	7.802
10	20 49 36.64	2.6804	21 35 56.7	7.964
11	20 52 17.32	2.6755	21 27 54.0	8.125
12	20 54 57.70	2.6705	21 19 41.7	8.284
13	20 57 37.78	2.6653	21 11 19.9	8.442
14	21 0 17.54	2.6600	21 2 48.7	8.598
15	21 2 56.98	2.6547	20 54 8.2	8.752
16	21 5 36.10	2.6493	20 45 18.5	8.904
17	21 8 14.90	2.6438	20 36 19.7	9.054
18	21 10 53.36	2.6382	20 27 12.0	9.202
19	21 13 31.48	2.6325	20 17 55.4	9.350
20	21 16 9.26	2.6267	20 8 30.0	9.497
21	21 18 46.69	2.6209	19 58 55.8	9.641
22	21 21 23.77	2.6151	19 49 13.1	9.782
23	21 24 0.50	2.6092	S.19 39 22.0	9.922

FRIDAY, AUGUST 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	21 26 36.87	2.6031	S.19 29 22.5	10.060

PHASES OF THE MOON.

		d	h	m
○ Full Moon	July	2	2	23.2
☾ Last Quarter		8	16	43.1
● New Moon		16	12	49.5
☽ First Quarter		24	14	44.0
○ Full Moon		31	9	24.5

		d	h
☾ Perigee	July	3	2.4
☾ Apogee		18	1.8
☾ Perigee		31	11.4

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Spica	W.	61° 55′ 4″	2128	63° 45′ 21″	2116	65° 35′ 55″	2105	67° 26′ 47″	2095
	JUPITER	E.	46 25 57	2077	44 34 22	2066	42 42 31	2057	40 50 26	2049
	Fomalhaut	E.	69 38 2	2295	67 51 55	2289	66 5 40	2285	64 19 19	2283
	α Pegasi	E.	87 53 9	2508	86 12 7	2499	84 30 52	2491	82 49 26	2485
2	Spica	W.	76 44 44	2054	78 36 54	2048	80 29 14	2043	82 21 41	2039
	Antares	W.	30 58 34	2108	32 49 21	2094	34 40 29	2083	36 31 54	2073
	Fomalhaut	E.	55 27 23	2294	53 41 15	2302	51 55 19	2312	50 9 37	2326
	α Pegasi	E.	74 20 54	2480	72 39 12	2483	70 57 35	2489	69 16 6	2497
	α Arietis	E.	116 51 2	2182	115 2 8	2172	113 12 58	2163	111 23 35	2155
3	Spica	W.	91 45 8	2030	93 37 55	2031	95 30 42	2033	97 23 26	2035
	Antares	W.	45 52 4	2045	47 44 28	2043	49 36 55	2042	51 29 24	2042
	Fomalhaut	E.	41 27 30	2442	39 44 57	2480	38 3 16	2523	36 22 35	2574
	α Pegasi	E.	60 52 39	2574	59 13 8	2598	57 34 10	2626	55 55 48	2655
	α Arietis	E.	102 14 17	2134	100 24 10	2133	98 34 0	2133	96 43 51	2134
4	Spica	W.	106 45 47	2057	108 37 52	2064	110 29 46	2072	112 21 28	2080
	Antares	W.	60 51 19	2056	62 43 27	2061	64 35 27	2066	66 27 18	2073
	α Pegasi	E.	47 56 3	2876	46 23 13	2936	44 51 40	3005	43 21 33	3083
	α Arietis	E.	87 33 57	2153	85 44 19	2160	83 54 51	2169	82 5 35	2176
	Aldebaran	E.	118 22 5	2039	116 29 32	2045	114 37 8	2051	112 44 53	2058
5	Antares	W.	75 43 39	2116	77 34 14	2126	79 24 33	2137	81 14 36	2149
	α Arietis	E.	73 2 55	2233	71 15 16	2247	69 27 58	2261	67 41 1	2277
	Aldebaran	E.	103 26 43	2103	101 35 48	2114	99 45 9	2126	97 54 47	2137
	SUN	E.	138 53 41	2383	137 9 42	2394	135 25 58	2405	133 42 31	2418
6	Antares	W.	90 20 16	2212	92 8 25	2226	93 56 14	2241	95 43 41	2255
	α Aquilæ	W.	50 38 50	3566	51 58 1	3514	53 18 10	3466	54 39 12	3425
	JUPITER	W.	29 7 6	2182	30 56 0	2195	32 44 37	2208	34 32 54	2220
	α Arietis	E.	58 52 26	2368	57 8 6	2389	55 24 16	2412	53 40 59	2435
	Aldebaran	E.	88 47 32	2200	86 59 4	2213	85 10 56	2227	83 23 10	2241
	SUN	E.	125 9 52	2486	123 28 19	2500	121 47 6	2515	120 6 15	2531
7	Antares	W.	104 35 30	2331	106 20 45	2347	108 5 36	2363	109 50 4	2379
	α Aquilæ	W.	61 34 2	3293	62 58 22	3277	64 23 0	3265	65 47 52	3256
	JUPITER	W.	43 29 34	2287	45 15 53	2301	47 1 51	2316	48 47 29	2331
	α Arietis	E.	45 13 28	2575	43 33 58	2609	41 55 15	2645	40 17 19	2683
	Aldebaran	E.	74 29 47	2317	72 44 13	2332	70 59 2	2348	69 14 14	2364
	SUN	E.	111 47 23	2612	110 8 43	2628	108 30 26	2645	106 52 31	2661
8	α Aquilæ	W.	72 54 12	3239	74 19 35	3241	75 44 56	3244	77 10 13	3249
	JUPITER	W.	57 30 6	2405	59 13 33	2420	60 56 40	2435	62 39 26	2450
	Fomalhaut	W.	37 33 38	2923	39 5 28	2903	40 37 43	2888	42 10 17	2876
	Aldebaran	E.	60 35 57	2445	58 53 26	2461	57 11 17	2477	55 29 32	2493
	SUN	E.	98 48 33	2744	97 12 52	2760	95 37 34	2777	94 2 37	2794
9	α Aquilæ	W.	84 14 43	3291	85 39 5	3302	87 3 14	3314	88 27 9	3327
	JUPITER	W.	71 7 56	2523	72 48 37	2538	74 28 58	2552	76 8 59	2566
	Fomalhaut	W.	49 55 44	2855	51 29 1	2856	53 2 16	2858	54 35 29	2861
	α Pegasi	W.	37 19 46	3891	38 33 15	3810	39 48 7	3742	41 4 10	3682

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Spica	W.	69° 17′ 55″	2065	71° 9′ 18″	2076	73° 0′ 54″	2068	74° 52′ 43″	2061
	Jupiter	E.	38 58 8	2041	37 5 38	2035	35 12 58	2029	33 20 9	2024
	Fomalhaut	E.	62 32 55	2963	60 46 27	2963	59 0 2	2985	57 13 40	2988
	α Pegasi	E.	81 7 52	2481	79 26 12	2478	77 44 27	2476	76 2 40	2477
2	Spica	W.	84 14 14	2035	86 6 53	2033	87 59 36	2032	89 52 21	2031
	Antares	W.	38 23 35	2065	40 15 28	2058	42 7 32	2052	43 59 45	2048
	Fomalhaut	E.	48 24 14	2343	46 39 15	2362	44 54 45	2383	43 10 48	2408
	α Pegasi	E.	67 34 49	2508	65 53 47	2520	64 13 2	2535	62 32 37	2554
	α Arietis	E.	109 33 59	2149	107 44 14	2143	105 54 21	2139	104 4 21	2136
3	Spica	W.	99 16 6	2038	101 8 41	2042	103 1 11	2046	104 53 33	2051
	Antares	W.	53 21 53	2043	55 14 20	2045	57 6 44	2048	58 59 5	2052
	Fomalhaut	E.	34 43 5	2635	33 4 58	2705	31 28 25	2788	29 53 41	2888
	α Pegasi	E.	54 18 7	2689	52 41 13	2728	51 5 10	2771	49 30 4	2821
	α Arietis	E.	94 53 43	2136	93 3 38	2139	91 13 38	2143	89 23 44	2147
4	Spica	W.	114 12 57	2089	116 4 13	2099	117 55 13	2111	119 45 57	2124
	Antares	W.	68 18 59	2081	70 10 28	2088	72 1 46	2097	73 52 50	2107
	α Pegasi	E.	41 53 3	3170	40 26 18	3268	39 1 29	3379	37 38 49	3506
	α Arietis	E.	80 16 32	2186	78 27 43	2196	76 39 10	2207	74 50 53	2220
	Aldebaran	E.	110 52 50	2066	109 0 58	2074	107 9 19	2083	105 17 53	2093
5	Antares	W.	83 4 21	2161	84 53 48	2173	86 42 56	2185	88 31 46	2198
	α Arietis	E.	65 54 27	2296	64 8 17	2307	62 22 33	2328	60 37 15	2348
	Aldebaran	E.	96 4 42	2148	94 14 56	2160	92 25 28	2173	90 36 20	2186
	Sun	E.	131 59 22	2431	130 16 31	2443	128 33 58	2458	126 51 45	2471
6	Antares	W.	97 30 47	2270	99 17 31	2284	101 3 54	2300	102 49 53	2315
	α Aquilæ	W.	56 1 0	3390	57 23 28	3360	58 46 30	3334	60 10 4	3312
	Jupiter	W.	36 20 52	2232	38 8 32	2246	39 55 53	2260	41 42 54	2273
	α Arietis	E.	51 58 14	2461	50 16 6	2487	48 34 34	2514	46 53 40	2544
	Aldebaran	E.	81 35 45	2256	79 48 40	2271	78 1 59	2286	76 15 41	2301
	Sun	E.	118 25 45	2547	116 45 37	2563	115 5 50	2579	113 26 25	2595
7	Antares	W.	111 34 9	2395	113 17 51	2411	115 1 10	2428	116 44 5	2445
	α Aquilæ	W.	67 12 55	3248	68 38 7	3242	70 3 26	3240	71 28 48	3238
	Jupiter	W.	50 32 43	2346	52 17 36	2360	54 2 7	2375	55 46 17	2390
	α Arietis	E.	38 40 16	2725	37 4 9	2770	35 29 2	2819	33 54 59	2874
	Aldebaran	E.	67 29 49	2380	65 45 46	2396	64 2 7	2412	62 18 50	2428
	Sun	E.	105 14 58	2678	103 37 48	2694	102 1 1	2711	100 24 36	2727
8	α Aquilæ	W.	78 35 24	3255	80 0 28	3263	81 25 23	3271	82 50 8	3280
	Jupiter	W.	64 21 50	2465	66 3 53	2480	67 45 34	2495	69 26 56	2509
	Fomalhaut	W.	43 43 6	2867	45 16 7	2862	46 49 15	2859	48 22 29	2856
	Aldebaran	E.	53 48 9	2509	52 7 8	2523	50 26 30	2539	48 46 13	2556
	Sun	E.	92 28 2	2811	90 53 49	2828	89 19 57	2844	87 46 26	2860
9	α Aquilæ	W.	89 50 49	3349	91 14 12	3357	92 37 18	3372	94 0 7	3389
	Jupiter	W.	77 48 41	2580	79 28 4	2594	81 7 8	2608	82 45 54	2621
	Fomalhaut	W.	56 8 38	2866	57 41 41	2871	59 14 38	2877	60 47 28	2883
	α Pegasi	W.	42 21 16	3627	43 39 21	3581	44 58 16	3541	46 17 55	3506

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L of Diff.	IXh.	P. L. of Diff.
9	Aldebaran	E.	47° 6′ 19″	2573	45° 26′ 47″	2589	43° 47′ 36″	2605	42° 8′ 48″	2621
	Sun	E.	86 13 16	2876	84 40 27	2892	83 7 58	2908	81 35 48	2923
10	α Aquilæ	W.	95 22 36	3405	96 44 47	3424	98 6 36	3443	99 28 4	3463
	Jupiter	W.	84 24 22	2634	86 2 31	2647	87 40 24	2660	89 17 59	2673
	Fomalhaut	W.	62 20 11	2889	63 52 44	2896	65 25 10	2904	66 57 26	2911
	α Pegasi	W.	47 38 12	3479	48 59 0	3452	50 20 18	3426	51 42 5	3406
	Aldebaran	E.	34 0 7	2701	32 23 28	2718	30 47 11	2735	29 11 15	2752
	Sun	E.	73 59 52	2997	72 29 36	3011	70 59 38	3025	69 29 57	3039
11	Jupiter	W.	97 21 52	2730	98 57 52	2741	100 33 38	2752	102 9 9	2763
	Fomalhaut	W.	74 36 14	2951	76 7 28	2959	77 38 31	2968	79 9 23	2977
	α Pegasi	W.	58 35 32	3346	59 58 50	3337	61 22 19	3332	62 45 54	3327
	Sun	E.	62 5 43	3105	60 37 40	3117	59 9 51	3129	57 42 17	3141
12	Jupiter	W.	110 3 21	2812	111 37 33	2821	113 11 32	2830	114 45 20	2839
	Fomalhaut	W.	86 40 57	3022	88 10 42	3031	89 40 17	3040	91 9 39	3049
	α Pegasi	W.	69 44 43	3319	71 8 33	3319	72 32 22	3320	73 56 10	3322
	Sun	E.	50 27 57	3198	49 1 45	3208	47 35 44	3218	46 9 56	3228
13	Fomalhaut	W.	98 33 46	3095	100 2 2	3104	101 30 7	3114	102 58 0	3124
	α Pegasi	W.	80 54 28	3338	82 17 56	3343	83 41 18	3347	85 4 35	3352
	Sun	E.	39 3 50	3276	37 39 10	3285	36 14 40	3294	34 50 21	3303
18	Sun	W.	16 23 44	3495	17 44 14	3490	19 4 51	3485	20 25 33	3480
	Spica	E.	70 49 11	3109	69 21 12	3110	67 53 14	3111	66 25 18	3112
	Antares	E.	116 43 37	3105	115 15 33	3105	113 47 30	3104	112 19 25	3104
19	Sun	W.	27 10 11	3461	28 31 19	3458	29 52 30	3454	31 13 45	3451
	Spica	E.	59 5 49	3114	57 37 57	3114	56 10 4	3114	54 42 12	3113
	Antares	E.	104 58 51	3099	103 30 40	3097	102 2 27	3095	100 34 12	3093
20	Sun	W.	38 0 55	3433	39 22 34	3429	40 44 19	3424	42 6 8	3419
	Spica	E.	47 22 41	3112	45 54 46	3111	44 26 49	3111	42 58 52	3110
	Antares	E.	93 12 12	3080	91 43 38	3077	90 15 0	3073	88 46 16	3069
21	Sun	W.	48 56 45	3390	50 19 13	3383	51 41 48	3376	53 4 32	3369
	Regulus	W.	19 36 4	3119	21 3 50	3101	22 31 58	3086	24 0 25	3072
	Spica	E.	35 38 57	3110	34 10 59	3110	32 43 2	3112	31 15 7	3114
	Antares	E.	81 21 19	3044	79 52 1	3038	78 22 36	3032	76 53 3	3026
22	Sun	W.	60 0 27	3326	61 24 8	3316	62 48 1	3306	64 12 5	3296
	Regulus	W.	31 26 59	3005	32 57 5	2993	34 27 27	2981	35 58 3	2969
	Venus	W.	22 6 54	3459	23 28 0	3444	24 49 24	3429	26 11 6	3414
	Antares	E.	69 23 12	2989	67 52 46	2981	66 22 9	2972	64 51 22	2963
23	Sun	W.	71 15 38	3238	72 41 2	3225	74 6 42	3212	75 32 37	3198
	Regulus	W.	43 34 58	2907	45 7 8	2894	46 39 35	2881	48 12 20	2867
	Venus	W.	33 3 57	3340	34 27 22	3325	35 51 4	3310	37 15 3	3295
	Antares	E.	57 14 31	2916	55 42 32	2905	54 10 18	2894	52 37 51	2883
	α Aquilæ	E.	103 32 3	3660	102 14 33	3640	100 56 42	3619	99 38 28	3600
	Jupiter	E.	116 23 52	2845	114 50 22	2833	113 16 36	2821	111 42 35	2808

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
9	Aldebaran	E.	40° 30′ 21″	2636	38° 52′ 15″	2652	37° 14′ 32″	2668	35° 37′ 8″	2684
	Sun	E.	80 3 59	2939	78 32 29	2954	77 1 18	2969	75 30 26	2983
10	α Aquilæ	W.	100 49 10	3483	102 9 53	3505	103 30 12	3527	104 50 6	3550
	Jupiter	W.	90 55 18	2684	92 32 20	2695	94 9 6	2707	95 45 37	2719
	Fomalhaut	W.	68 29 32	2918	70 1 28	2926	71 33 14	2934	73 4 49	2942
	α Pegasi	W.	53 4 13	3391	54 26 40	3375	55 49 25	3364	57 12 23	3354
	Aldebaran	E.	27 35 43	2769	26 0 35	2789	24 25 52	2809	22 51 33	2829
	Sun	E.	68 0 34	3053	66 31 27	3066	65 2 36	3079	63 34 2	3092
11	Jupiter	W.	103 44 26	2773	105 19 29	2782	106 54 19	2792	108 28 56	2802
	Fomalhaut	W.	80 40 4	2986	82 10 34	2995	83 40 53	3004	85 11 1	3013
	α Pegasi	W.	64 9 34	3324	65 33 18	3321	66 57 5	3320	68 20 53	3319
	Sun	E.	56 14 58	3153	54 47 53	3165	53 21 1	3176	51 54 22	3187
12	Jupiter	W.	116 18 57	2848	117 52 22	2856	119 25 37	2866	120 58 40	2873
	Fomalhaut	W.	92 38 51	3058	94 7 52	3068	95 36 41	3077	97 5 19	3086
	α Pegasi	W.	75 19 56	3325	76 43 39	3327	78 7 19	3330	79 30 56	3334
	Sun	E.	44 44 20	3238	43 18 56	3248	41 53 43	3258	40 28 41	3267
13	Fomalhaut	W.	104 25 41	3133	105 53 11	3143	107 20 29	3153	108 47 36	3163
	α Pegasi	W.	86 27 46	3358	87 50 50	3364	89 13 48	3371	90 36 38	3376
	Sun	E.	33 26 12	3310	32 2 12	3319	30 38 23	3328	29 14 44	3337
18	Sun	W.	21 46 18	3475	23 7 10	3471	24 28 7	3468	25 49 7	3464
	Spica	E.	64 57 23	3113	63 29 29	3113	62 1 35	3114	60 33 42	3114
	Antares	E.	110 51 20	3103	109 23 15	3102	107 55 8	3101	106 27 0	3100
19	Sun	W.	32 35 3	3448	33 56 25	3445	35 17 51	3441	36 39 21	3437
	Spica	E.	53 14 19	3113	51 46 25	3113	50 18 31	3113	48 50 37	3112
	Antares	E.	99 5 54	3091	97 37 33	3090	96 9 10	3087	94 40 42	3084
20	Sun	W.	43 28 3	3414	44 50 4	3408	46 12 11	3402	47 34 25	3396
	Spica	E.	41 30 54	3109	40 2 55	3109	38 34 56	3109	37 6 56	3109
	Antares	E.	87 17 28	3065	85 48 35	3060	84 19 35	3055	82 50 30	3050
21	Sun	W.	54 27 24	3361	55 50 25	3352	57 13 36	3344	58 36 57	3335
	Regulus	W.	25 29 10	3059	26 58 12	3045	28 27 32	3031	29 57 8	3018
	Spica	E.	29 47 15	3119	28 19 30	3124	26 51 50	3130	25 24 17	3140
	Antares	E.	75 23 22	3019	73 53 33	3012	72 23 35	3005	70 53 28	2997
22	Sun	W.	65 36 22	3285	67 0 51	3274	68 25 33	3262	69 50 28	3250
	Regulus	W.	37 28 55	2956	39 0 3	2944	40 31 25	2932	42 3 3	2920
	Venus	W.	27 33 6	3399	28 55 24	3384	30 17 59	3369	31 40 49	3354
	Antares	E.	63 20 24	2954	61 49 14	2945	60 17 52	2936	58 46 18	2926
23	Sun	W.	76 58 48	3184	78 25 16	3170	79 52 1	3155	81 19 4	3140
	Regulus	W.	49 45 21	2853	51 18 40	2839	52 52 18	2825	54 26 15	2810
	Venus	W.	38 39 20	3280	40 3 55	3264	41 28 49	3248	42 54 2	3231
	Antares	E.	51 5 11	2871	49 32 15	2860	47 59 5	2849	46 25 40	2837
	α Aquilæ	E.	98 19 54	3580	97 0 58	3563	95 41 43	3545	94 22 9	3528
	Jupiter	E.	110 8 18	2795	108 33 43	2782	106 58 52	2769	105 23 42	2755

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^{h}.	P. L. of Diff.	VI^{h}.	P. L. of Diff.	IX^{h}.	P. L. of Diff.
24	Sun	W.	82° 46′ 24″	3125	84° 14′ 3″	3109	85° 42′ 1″	3093	87° 10′ 19″	3077
	Regulus	W.	56 0 29	2795	57 35 4	2780	59 9 58	2764	60 45 13	2748
	Venus	W.	44 19 33	3214	45 45 25	3197	47 11 36	3180	48 38 8	3163
	Antares	E.	44 52 1	2825	43 18 6	2814	41 43 56	2803	40 9 30	2791
	α Aquilæ	E.	93 2 16	3512	91 42 5	3496	90 21 36	3480	89 0 50	3465
	Jupiter	E.	103 48 14	2745	102 12 28	2728	100 36 22	2711	98 59 56	2694
25	Sun	W.	94 36 57	2990	96 7 22	2972	97 38 9	2954	99 9 19	2935
	Regulus	W.	68 46 45	2666	70 24 10	2649	72 1 59	2632	73 40 11	2614
	Venus	W.	55 56 9	3073	57 24 52	3054	58 53 59	3035	60 23 29	3016
	Antares	E.	32 13 43	2739	30 37 55	2730	29 1 55	2722	27 25 44	2713
	α Aquilæ	E.	82 13 13	3405	80 51 2	3394	70 28 39	3386	78 6 6	3378
	Jupiter	E.	90 52 36	2615	89 14 2	2599	87 35 5	2582	85 55 46	2565
26	Sun	W.	106 51 9	2840	108 24 45	2821	109 58 46	2801	111 33 12	2782
	Regulus	W.	81 57 14	2524	83 37 54	2506	85 19 0	2488	87 0 31	2469
	Venus	W.	67 57 6	2916	69 29 5	2896	71 1 30	2876	72 34 21	2856
	Spica	W.	28 22 3	2635	30 0 11	2605	31 38 59	2576	33 18 27	2549
	α Aquilæ	E.	71 11 31	3356	69 48 24	3357	68 25 18	3359	67 2 14	3363
	Jupiter	E.	77 33 6	2476	75 51 19	2457	74 9 7	2439	72 26 29	2421
27	Sun	W.	119 31 50	2684	121 8 51	2665	122 46 18	2646	124 24 11	2627
	Regulus	W.	95 34 39	2377	97 18 47	2359	99 3 22	2341	100 48 24	2322
	Venus	W.	80 25 9	2753	82 0 38	2733	83 36 33	2713	85 12 56	2693
	Spica	W.	41 44 44	2427	43 27 40	2405	45 11 7	2383	46 55 6	2362
	α Aquilæ	E.	60 9 2	3423	58 47 11	3445	57 25 45	3470	56 4 47	3501
	Jupiter	E.	63 46 51	2331	62 1 37	2313	60 15 56	2295	58 29 50	2277
	Fomalhaut	E.	89 9 4	2542	87 28 50	2524	85 48 10	2507	84 7 6	2490
	α Pegasi	E.	106 24 27	2813	104 50 16	2787	103 15 31	2763	101 40 14	2739
28	Venus	W.	93 21 20	2599	95 0 17	2581	96 39 40	2563	98 19 27	2545
	Spica	W.	55 42 29	2263	57 29 23	2245	59 16 44	2227	61 4 32	2209
	Jupiter	E.	49 32 50	2192	47 44 11	2176	45 55 8	2161	44 5 41	2145
	Fomalhaut	E.	75 36 5	2414	73 52 49	2401	72 9 15	2388	70 25 23	2376
	α Pegasi	E.	93 36 25	2635	91 58 18	2618	90 19 47	2601	88 40 53	2586
29	Spica	W.	70 9 47	2131	71 59 59	2116	73 50 33	2103	75 41 28	2090
	Antares	W.	24 30 25	2224	26 18 17	2196	28 6 51	2172	29 56 1	2149
	Jupiter	E.	34 52 55	2077	33 1 21	2067	31 9 30	2058	29 17 23	2049
	Fomalhaut	E.	61 42 22	2335	59 57 14	2331	58 11 59	2328	56 26 41	2327
	α Pegasi	E.	80 21 39	2526	78 41 2	2518	77 0 14	2512	75 19 18	2507
30	Spica	W.	85 0 36	2037	86 53 12	2028	88 46 2	2021	90 39 4	2014
	Antares	W.	39 9 31	2064	41 1 26	2052	42 53 40	2042	44 46 12	2030
	Fomalhaut	E.	47 40 50	2357	45 56 13	2371	44 11 57	2390	42 28 8	2412
	α Pegasi	E.	66 53 47	2512	65 12 50	2519	63 32 3	2529	61 51 30	2540
	α Arietis	E.	108 49 16	2147	106 59 29	2136	105 9 25	2126	103 19 6	2117
31	Spica	W.	100 6 29	1992	102 0 16	1990	103 54 6	1989	105 47 57	1989
	Antares	W.	54 12 9	1996	56 5 49	1993	57 59 35	1990	59 53 25	1988
	α Pegasi	E.	53 34 26	2653	51 56 43	2688	50 19 47	2729	48 43 45	2775
	α Arietis	E.	94 4 37	2066	92 13 20	2066	90 21 59	2065	88 30 36	2064

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff
24	**Sun**	W.	88° 38′ 57″	3060	90° 7′ 55″	3043	91° 37′ 14″	3026	93° 6′ 55″	3008
	Regulus	W.	62 20 48	2732	63 56 45	2716	65 33 3	2700	67 9 43	2683
	Venus	W.	50 5 1	3146	51 32 15	3128	52 59 50	3110	54 27 48	3091
	Antares	E.	38 34 50	2779	36 59 55	2768	35 24 45	2757	33 49 21	2747
	α Aquilæ	E.	87 39 48	3453	86 18 31	3439	84 56 59	3426	83 35 12	3415
	Jupiter	E.	97 23 10	2681	95 46 4	2665	94 8 36	2649	92 30 47	2632
25	**Sun**	W.	100 40 53	2916	102 12 51	2898	103 45 12	2879	105 17 58	2859
	Regulus	W.	75 18 46	2596	76 57 46	2578	78 37 11	2560	80 17 0	2542
	Venus	W.	61 53 23	2996	63 23 41	2976	64 54 25	2956	66 25 33	2936
	Antares	E.	25 49 30	2719	24 13 15	2719	22 37 0	2719	21 0 46	2719
	α Aquilæ	E.	76 43 24	3371	75 20 34	3365	73 57 37	3361	72 34 36	3358
	Jupiter	E.	84 16 2	2548	82 35 55	2530	80 55 23	2512	79 14 27	2494
26	**Sun**	W.	113 8 4	2762	114 43 22	2743	116 19 5	2722	117 55 15	2704
	Regulus	W.	88 42 28	2450	90 24 51	2432	92 7 41	2414	93 50 57	2395
	Venus	W.	74 7 37	2835	75 41 20	2815	77 15 30	2795	78 50 6	2774
	Spica	W.	34 58 32	2523	36 39 13	2498	38 20 29	2473	40 2 20	2450
	α Aquilæ	E.	65 39 15	3369	64 16 23	3379	62 53 42	3390	61 31 13	3405
	Jupiter	E.	70 43 26	2403	68 59 56	2385	67 16 1	2367	65 31 39	2349
27	**Sun**	W.	126 2 29	2608	127 41 13	2590	129 20 22	2572	130 59 56	2554
	Regulus	W.	102 33 51	2304	104 19 44	2286	106 6 4	2270	107 52 48	2252
	Venus	W.	86 49 44	2673	88 27 0	2654	90 4 40	2635	91 42 47	2617
	Spica	W.	48 39 36	2341	50 24 36	2321	52 10 5	2302	53 56 2	2282
	α Aquilæ	E.	54 44 24	3536	53 24 40	3578	52 5 42	3626	50 47 36	3682
	Jupiter	E.	56 43 17	2260	54 56 19	2243	53 8 55	2226	51 21 5	2209
	Fomalhaut	E.	82 25 39	2473	80 43 48	2458	79 1 35	2443	77 19 0	2428
	α Pegasi	E.	100 4 26	2716	98 28 8	2695	96 51 21	2674	95 14 6	2654
28	**Venus**	W.	99 59 38	2528	101 40 12	2512	103 21 9	2495	105 2 29	2480
	Spica	W.	62 52 46	2192	64 41 25	2176	66 30 28	2160	68 19 56	2145
	Jupiter	E.	42 15 51	2131	40 25 39	2117	38 35 5	2103	36 44 10	2089
	Fomalhaut	E.	68 41 14	2365	66 56 49	2356	65 12 12	2348	63 27 22	2341
	α Pegasi	E.	87 1 39	2572	85 22 4	2559	83 42 12	2546	82 2 2	2536
29	Spica	W.	77 32 43	2078	79 24 16	2067	81 16 6	2056	83 8 13	2046
	Antares	W.	31 45 45	2128	33 36 2	2109	35 26 47	2093	37 17 57	2077
	Jupiter	E.	27 25 2	2041	25 32 29	2032	23 39 44	2024	21 46 46	2019
	Fomalhaut	E.	54 41 21	2328	52 56 2	2331	51 10 49	2337	49 25 44	2345
	α Pegasi	E.	73 38 15	2504	71 57 8	2503	70 15 59	2504	68 34 51	2507
30	Spica	W.	92 32 17	2008	94 25 39	2003	96 19 9	1998	98 12 46	1994
	Antares	W.	46 38 59	2020	48 32 0	2014	50 25 13	2007	52 18 37	2001
	Fomalhaut	E.	40 44 51	2441	39 2 13	2475	37 20 25	2517	35 39 36	2568
	α Pegasi	E.	60 11 13	2556	58 31 18	2575	56 51 49	2597	55 12 50	2623
	α Arietis	E.	101 28 33	2109	99 37 48	2103	97 46 53	2097	95 55 49	2092
31	Spica	W.	107 41 48	1990	109 35 38	1992	111 29 25	1994	113 23 8	1998
	Antares	W.	61 47 18	1987	63 41 12	1987	65 35 6	1988	67 28 59	1990
	α Pegasi	E.	47 8 43	2828	45 34 51	2887	44 2 15	2955	42 31 6	3033
	α Arietis	E.	86 39 12	2085	84 47 50	2086	82 56 30	2089	81 5 14	2094

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to / Subtracted from Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Frid.	1	8 46 16.74	9.702	N.17 58 57.5	−37.90	15 48.08	66.64	6 4.78	0.154
Sat.	2	8 50 9.28	9.677	17 43 39.1	38.63	15 48.21	66.55	6 0.78	0.179
SUN.	3	8 54 1.22	9.652	17 28 3.4	39.34	15 48.34	66.46	5 56.18	0.204
Mon.	4	8 57 52.57	9.628	17 12 10.6	−40.05	15 48.47	66.37	5 50.98	0.228
Tues.	5	9 1 43.33	9.604	16 56 1.1	40.74	15 48.60	66.29	5 45.21	0.252
Wed.	6	9 5 33.51	9.580	16 39 35.2	41.42	15 48.74	66.20	5 38.85	0.276
Thur.	7	9 9 23.12	9.555	16 22 53.0	−42.09	15 48.98	66.12	5 31.91	0.300
Frid.	8	9 13 12.15	9.531	16 5 55.0	42.75	15 49.03	66.03	5 24.40	0.324
Sat.	9	9 17 0.62	9.508	15 48 41.3	43.39	15 49.18	65.95	5 16.34	0.347
SUN.	10	9 20 48.53	9.485	15 31 12.4	−44.02	15 49.34	65.86	5 7.72	0.370
Mon.	11	9 24 35.88	9.462	15 13 28.4	44.64	15 49.50	65.77	4 58.54	0.393
Tues.	12	9 28 22.68	9.439	14 55 29.8	45.25	15 49.66	65.69	4 48.81	0.416
Wed.	13	9 32 8.94	9.416	14 37 16.8	−45.84	15 49.83	65.61	4 38.54	0.439
Thur.	14	9 35 54.66	9.394	14 18 49.7	46.42	15 50.00	65.53	4 27.74	0.461
Frid.	15	9 39 39.84	9.372	14 0 8.9	46.98	15 50.17	65.45	4 16.40	0.483
Sat.	16	9 43 24.49	9.350	13 41 14.7	−47.54	15 50.35	65.38	4 4.53	0.505
SUN.	17	9 47 8.62	9.328	13 22 7.4	48.07	15 50.54	65.30	3 52.13	0.527
Mon.	18	9 50 52.23	9.307	13 2 47.4	48.59	15 50.73	65.23	3 39.22	0.548
Tues.	19	9 54 35.34	9.286	12 43 14.9	−49.10	15 50.93	65.16	3 25.81	0.569
Wed.	20	9 58 17.94	9.265	12 23 30.4	49.59	15 51.13	65.09	3 11.90	0.590
Thur.	21	10 2 0.05	9.245	12 3 34.1	50.07	15 51.33	65.02	2 57.50	0.610
Frid.	22	10 5 41.68	9.225	11 43 26.5	−50.54	15 51.54	64.96	2 42.62	0.629
Sat.	23	10 9 22.85	9.206	11 23 7.9	51.00	15 51.75	64.89	2 27.27	0.648
SUN.	24	10 13 3.57	9.187	11 2 38.5	51.44	15 51.96	64.83	2 11.48	0.667
Mon.	25	10 16 43.85	9.168	10 41 58.6	−51.87	15 52.17	64.77	1 55.25	0.685
Tues.	26	10 20 23.71	9.152	10 21 8.7	52.28	15 52.39	64.71	1 38.60	0.702
Wed.	27	10 24 3.17	9.136	10 0 9.0	52.68	15 52.61	64.65	1 21.55	0.718
Thur.	28	10 27 42.24	9.120	9 38 59.9	−53.07	15 52.83	64.60	1 4.11	0.734
Frid.	29	10 31 20.94	9.105	9 17 41.5	53.45	15 53.05	64.55	0 46.31	0.749
Sat.	30	10 34 59.30	9.091	8 56 14.4	53.81	15 53.28	64.50	0 28.17	0.763
SUN.	31	10 38 37.33	9.078	8 34 38.7	54.16	15 53.50	64.45	0 9.70	0.776
Mon.	32	10 42 15.05	9.066	N. 8 12 54.8	−54.50	15 53.73	64.40	0 9.08	0.788

NOTE.—The mean time of semidiameter passing may be found by subtracting $0^s.18$ from the sidereal time.

The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	Equation of Time, to be Subtracted from / Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Frid.	1	8 46 15.76	9.702	N. 17 59 1.4	-37.90	6 4.80	0.154	8 40 10.96
Sat.	2	8 50 8.31	9.677	17 43 43.0	38.63	6 0.79	0.179	8 44 7.52
SUN.	3	8 54 0.27	9.652	17 28 7.3	39.34	5 56.19	0.204	8 48 4.07
Mon.	4	8 57 51.63	9.628	17 12 14.5	-40.05	5 51.00	0.228	8 52 0.63
Tues.	5	9 1 42.41	9.604	16 56 5.0	40.74	5 45.23	0.252	8 55 57.18
Wed.	6	9 5 32.61	9.580	16 39 39.1	41.42	5 38.87	0.276	8 59 53.74
Thur.	7	9 9 22.24	9.556	16 22 56.9	-42.09	5 31.93	0.300	9 3 50.30
Frid.	8	9 13 11.29	9.532	16 5 58.8	42.75	5 24.43	0.324	9 7 46.86
Sat.	9	9 16 59.78	9.509	15 48 45.1	43.39	5 16.37	0.347	9 11 43.41
SUN.	10	9 20 47.71	9.486	15 31 16.1	-44.02	5 7.75	0.370	9 15 39.97
Mon.	11	9 24 35.09	9.463	15 13 32.1	44.64	4 58.57	0.393	9 19 36.52
Tues.	12	9 28 21.92	9.440	14 55 33.4	45.25	4 48.84	0.416	9 23 33.08
Wed.	13	9 32 8.21	9.417	14 37 20.3	-45.84	4 38.57	0.439	9 27 29.63
Thur.	14	9 35 53.96	9.395	14 18 53.1	46.42	4 27.77	0.461	9 31 26.19
Frid.	15	9 39 39.17	9.373	14 0 12.2	46.98	4 16.43	0.483	9 35 22.74
Sat.	16	9 43 23.85	9.351	13 41 17.9	-47.54	4 4.56	0.505	9 39 19.30
SUN.	17	9 47 8.01	9.329	13 22 10.5	48.08	3 52.16	0.527	9 43 15.85
Mon.	18	9 50 51.66	9.308	13 2 50.3	48.60	3 39.25	0.548	9 47 12.41
Tues.	19	9 54 34.80	9.287	12 43 17.7	-49.11	3 25.84	0.569	9 51 8 96
Wed.	20	9 58 17.44	9.266	12 23 33.0	49.60	3 11.93	0.590	9 55 5.51
Thur.	21	10 1 59.59	9.246	12 3 36.6	50.08	2 57.53	0.610	9 59 2.06
Frid.	22	10 5 41.26	9.227	11 43 28.8	-50.55	2 42.65	0.629	10 2 58.62
Sat.	23	10 9 22.47	9.208	11 23 10.0	51.01	2 27.30	0.648	10 6 55.17
SUN.	24	10 13 3.23	9.189	11 2 40.4	51.45	2 11.50	0.667	10 10 51.73
Mon.	25	10 16 43.56	9.171	10 42 0.3	-51.88	1 55.27	0.685	10 14 48.28
Tues.	26	10 20 23.46	9.154	10 21 10.2	52.29	1 38.62	0.702	10 18 44.84
Wed.	27	10 24 2.96	9.138	10 0 10.3	52.69	1 21.57	0.718	10 22 41.39
Thur.	28	10 27 42.07	9.122	9 39 0.9	-53.08	1 4.12	0.734	10 26 37.95
Frid.	29	10 31 20.82	9.107	9 17 42.3	53.46	0 46.32	0.749	10 30 34.50
Sat.	30	10 34 59.22	9.093	8 56 14.9	53.82	0 28.17	0.763	10 34 31.05
SUN.	31	10 38 37.30	9.080	8 34 38.9	54.17	0 9.70	0.776	10 38 27.60
Mon.	32	10 42 15.07	9.068	N. 8 12 54.7	-54.51	0 9.08	0.788	10 42 24.16

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing.

Diff. for 1 hour, $+9^{s}.8565$ (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	213	129 8 3.2	7 49.7	143.52	− 0.48	0.0063304	−24.1	15 17 18.34
2	214	130 5 28.2	5 14.5	143.56	0.54	0.0062720	24.6	15 13 22.43
3	215	131 2 54.1	2 40.3	143.60	0.57	0.0062125	25.1	15 9 26.52
4	216	132 0 21.1	0 7.1	143.65	− 0.58	0.0061517	−25.6	15 5 30.61
5	217	132 57 49.4	57 35.2	143.70	0.56	0.0060895	26.2	15 1 34.70
6	218	133 55 19.0	55 4.7	143.75	0.50	0.0060259	26.8	14 57 38.79
7	219	134 52 49.9	52 35.5	143.81	− 0.42	0.0059608	−27.4	14 53 42.89
8	220	135 50 22.2	50 7.7	143.87	0.31	0.0058941	28.1	14 49 46.98
9	221	136 47 55.8	47 41.1	143.92	0.19	0.0058257	28.9	14 45 51.07
10	222	137 45 30.8	45 15.9	143.98	− 0.06	0.0057554	−29.7	14 41 55.16
11	223	138 43 7.3	42 52.3	144.04	+ 0.07	0.0056831	30.5	14 37 59.24
12	224	139 40 45.2	40 30.1	144.10	0.19	0.0056087	31.4	14 34 3.33
13	225	140 38 24.5	38 9.3	144.16	+ 0.31	0.0055323	−32.3	14 30 7.42
14	226	141 36 5.2	35 49.8	144.23	0.41	0.0054538	33.2	14 26 11.51
15	227	142 33 47.2	33 31.7	144.29	0.48	0.0053731	34.1	14 22 15.60
16	228	143 31 30.6	31 15.0	144.34	+ 0.52	0.0052902	−35.0	14 18 19.69
17	229	144 29 15.3	28 59.6	144.39	0.54	0.0052051	35.9	14 14 23.78
18	230	145 27 1.2	26 45.4	144.44	0.52	0.0051180	36.7	14 10 27.88
19	231	146 24 48.2	24 32.3	144.49	+ 0.47	0.0050289	−37.5	14 6 31.98
20	232	147 22 36.5	22 20.4	144.54	0.40	0.0049379	38.3	14 2 36.07
21	233	148 20 26.0	20 9.8	144.59	0.30	0.0048451	39.0	13 58 40.16
22	234	149 18 16.7	18 0.4	144.64	+ 0.19	0.0047507	−39.6	13 54 44.25
23	235	150 16 8.6	15 52.2	144.69	+ 0.06	0.0046549	40.2	13 50 48.34
24	236	151 14 1.7	13 45.1	144.74	− 0.08	0.0045578	40.7	13 46 52.43
25	237	152 11 56.0	11 39.3	144.79	− 0.21	0.0044594	−41.2	13 42 56.52
26	238	153 9 51.6	9 34.8	144.85	0.33	0.0043600	41.6	13 39 0.62
27	239	154 7 48.6	7 31.7	144.90	0.44	0.0042598	41.9	13 35 4.72
28	240	155 5 47.0	5 30.0	144.96	− 0.54	0.0041588	−42.2	13 31 8.81
29	241	156 3 46.9	3 29.7	145.02	0.61	0.0040571	42.5	13 27 12.90
30	242	157 1 48.4	1 31.1	145.09	0.65	0.0039548	42.8	13 23 16.99
31	243	157 59 51.5	59 34.1	145.16	0.66	0.0038518	43.0	13 19 21.08
32	244	158 57 56.3	57 38.8	145.24	− 0.64	0.0037483	−43.2	13 15 25.17

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January 0ᵈ.0.

Diff. for 1 Hour, — 9ˢ.8296. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 45.2	16 43.0	61 22.4	−0.45	61 14.6	−0.85	13 18.3	2.45	15.5
2	16 39.7	16 35.1	61 2.2	1.22	60 45.5	1.55	14 15.1	2.28	16.5
3	16 29.6	16 23.3	60 25.2	1.82	60 1.9	2.04	15 7.8	2.13	17.5
4	16 16.3	16 8.9	59 36.4	−2.20	59 9.2	−2.30	15 57.5	2.03	18.5
5	16 1.3	15 53.6	58 41.2	2.35	58 12.9	2.35	16 45.5	1.99	19.5
6	15 46.0	15 38.5	57 44.9	2.30	57 17.7	2.22	17 32.8	1.97	20.5
7	15 31.4	15 24.7	56 51.6	−2.12	56 26.9	−1.99	18 20.3	1.99	21.5
8	15 18.5	15 12.7	56 4.0	1.84	55 42.9	1.68	19 8.4	2.02	22.5
9	15 7.5	15 2.8	55 23.7	1.52	55 6.5	1.35	19 57.4	2.06	23.5
10	14 58.7	14 55.1	54 51.3	−1.18	54 38.2	−1.02	20 47.6	2.10	24.5
11	14 52.0	14 49.5	54 26.9	0.86	54 17.6	0.71	21 38.2	2.09	25.5
12	14 47.4	14 45.8	54 10.0	0 56	54 4.2	0.43	22 28.0	2.04	26.5
13	14 44.7	14 44.0	53 59.9	−0.30	53 57.2	−0.17	23 16.0	1.96	27.5
14	14 43.6	14 43.7	53 56.0	−0.05	53 56.2	+0.08	6		28.5
15	14 44.1	14 44.9	53 57.8	0.19	54 0.6	0.30	0 2.5	1.89	29.5
16	14 46.0	14 47.5	54 4.8	+0.41	54 10.3	+0.52	0 47.0	1.82	0.8
17	14 49.4	14 51.6	54 17.2	0.64	54 25.4	0.75	1 29.9	1.76	1.8
18	14 54.2	14 57.2	54 35.0	0.86	54 46.0	0.99	2 11.7	1.74	2.8
19	15 0.6	15 4.5	54 58.5	+1.11	55 12.6	+1.25	2 53.3	1.75	3.8
20	15 8.8	15 13.4	55 28.3	1.38	55 45.5	1.51	3 35.6	1.79	4.8
21	15 18.6	15 24.1	56 4.4	1.64	56 24.7	1.76	4 19.5	1.89	5.8
22	15 30.2	15 36.4	56 46.5	+1.88	57 9.7	+1.98	5 6.2	2.02	6.8
23	15 43.0	15 49.8	57 34.0	2.06	57 59.1	2.12	5 56.7	2.20	7.8
24	15 56.8	16 3.8	58 24.8	2.15	58 50.5	2.13	6 51.7	2.38	8.8
25	16 10.7	16 17.4	59 15.9	+2 08	59 40.4	+1.98	7 50.9	2.53	9.8
26	16 23.6	16 29.3	60 3.3	1.82	60 24.0	1.61	8 53.4	2.62	10.8
27	16 34.1	16 38.1	60 41.9	1.35	60 56.3	1.04	9 56.7	2.61	11.8
28	16 40.9	16 42.5	61 6.7	+0.69	61 12.7	+0.31	10 58.6	2.52	12.8
29	16 42.9	16 42.0	61 14.1	−0.09	61 10.6	−0.50	11 57.5	2 38	13.8
30	16 39.7	16 36.2	61 2.3	0.89	60 49.4	1.25	12 52.8	2.24	14.8
31	16 31.6	16 25.9	60 32.4	1.58	60 11.7	1.86	13 45.1	2.13	15.8
32	16 19.5	16 12.4	59 48.0	−2.08	59 22.0	−2.24	14 35.3	2.07	16.8

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 1.					**SUNDAY 3.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	21 26 36.87	2.6031	S. 19 29 22.5	10.060	0	23 24 8.82	2.2984	S. 9 25 35.2	14.316
1	21 29 12.87	2.5969	19 19 14.8	10.196	1	23 26 26.55	2.2927	9 11 15.0	14.356
2	21 31 48.50	2.5907	19 8 59.0	10.330	2	23 28 43.95	2.2872	8 56 52.5	14.393
3	21 34 23.76	2.5845	18 58 35.2	10.462	3	23 31 1.02	2.2817	8 42 27.8	14.429
4	21 36 58.64	2.5783	18 48 3.5	10.593	4	23 33 17.76	2.2762	8 28 1.0	14.463
5	21 39 33.15	2.5720	18 37 24.0	10.722	5	23 35 34.17	2.2709	8 13 32.2	14.497
6	21 42 7.28	2.5656	18 26 36.9	10.848	6	23 37 50.26	2.2656	7 59 1.4	14.528
7	21 44 41.02	2.5592	18 15 42.3	10.972	7	23 40 6.04	2.2603	7 44 28.9	14.556
8	21 47 14.38	2.5527	18 4 40.3	11.095	8	23 42 21.50	2.2551	7 29 54.7	14.583
9	21 49 47.35	2.5463	17 53 30.9	11.216	9	23 44 36.65	2.2499	7 15 18.9	14.609
10	21 52 19.94	2.5398	17 42 14.4	11.334	10	23 46 51.49	2.2449	7 0 41.6	14.632
11	21 54 52.13	2.5332	17 30 50.8	11.451	11	23 49 6.04	2.2400	6 46 3.0	14.654
12	21 57 23.93	2.5267	17 19 20.3	11.565	12	23 51 20.29	2.2351	6 31 23.1	14.675
13	21 59 55.33	2.5201	17 7 43.0	11.677	13	23 53 34.25	2.2302	6 16 42.0	14.693
14	22 2 26.34	2.5136	16 55 59.0	11.787	14	23 55 47.92	2.2254	6 1 59.9	14.710
15	22 4 56.96	2.5070	16 44 8.5	11.896	15	23 58 1.30	2.2207	5 47 16.8	14.726
16	22 7 27.18	2.5004	16 32 11.5	12.002	16	0 0 14.40	2.2161	5 32 32.8	14.739
17	22 9 57.00	2.4938	16 20 8.3	12.105	17	0 2 27.23	2.2116	5 17 48.1	14.751
18	22 12 26.43	2.4872	16 7 58.9	12.207	18	0 4 39.79	2.2071	5 3 2.7	14.762
19	22 14 55.46	2.4805	15 55 43.4	12.307	19	0 6 52.08	2.2026	4 48 16.7	14.771
20	22 17 24.09	2.4738	15 43 22.0	12.405	20	0 9 4.10	2.1982	4 33 30.2	14.778
21	22 19 52.32	2.4672	15 30 54.8	12.501	21	0 11 15.86	2.1939	4 18 43.4	14.783
22	22 22 20.15	2.4606	15 18 21.9	12.595	22	0 13 27.37	2.1897	4 3 56.3	14.787
23	22 24 47.59	2.4540	S. 15 5 43.4	12.687	23	0 15 38.63	2.1857	S. 3 49 9.0	14.790
	SATURDAY 2.					**MONDAY 4.**			
0	22 27 14.63	2.4473	S. 14 52 59.5	12.776	0	0 17 49.65	2.1817	S. 3 34 21.5	14.792
1	22 29 41.27	2.4407	14 40 10.3	12.863	1	0 20 0.43	2.1777	3 19 34.0	14.791
2	22 32 7.52	2.4342	14 27 15.9	12.948	2	0 22 10.97	2.1737	3 4 46.6	14.788
3	22 34 33.38	2.4277	14 14 16.5	13.032	3	0 24 21.27	2.1698	2 49 59.4	14.785
4	22 36 58.85	2.4212	14 1 12.1	13.113	4	0 26 31.35	2.1661	2 35 12.4	14.781
5	22 39 23.93	2.4147	13 48 2.9	13.192	5	0 28 41.20	2.1624	2 20 25.7	14.774
6	22 41 48.61	2.4082	13 34 49.0	13.270	6	0 30 50.83	2.1587	2 5 39.5	14.766
7	22 44 12.91	2.4018	13 21 30.5	13.345	7	0 33 0.25	2.1552	1 50 53.8	14.757
8	22 46 36.82	2.3953	13 8 7.6	13.417	8	0 35 9.46	2.1518	1 36 8.6	14.747
9	22 49 0.34	2.3889	12 54 40.4	13.488	9	0 37 18.47	2.1485	1 21 24.1	14.735
10	22 51 23.48	2.3826	12 41 9.0	13.557	10	0 39 27.28	2.1452	1 6 40.4	14.722
11	22 53 46.25	2.3763	12 27 33.5	13.625	11	0 41 35.89	2.1419	0 51 57.5	14.707
12	22 56 8.64	2.3700	12 13 54.0	13.690	12	0 43 44.30	2.1387	0 37 15.6	14.690
13	22 58 30.65	2.3638	12 0 10.7	13.752	13	0 45 52.53	2.1357	0 22 34.7	14.673
14	23 0 52.29	2.3576	11 46 23.7	13.813	14	0 48 0.58	2.1327	S. 0 7 54.8	14.655
15	23 3 13.56	2.3514	11 32 33.1	13.872	15	0 50 8.45	2.1297	N. 0 6 43.9	14.635
16	23 5 34.46	2.3453	11 18 39.0	13.929	16	0 52 16.14	2.1268	0 21 21.4	14.614
17	23 7 55.00	2.3393	11 4 41.6	13.984	17	0 54 23.67	2.1241	0 35 57.6	14.592
18	23 10 15.18	2.3333	10 50 40.9	14.037	18	0 56 31.03	2.1214	0 50 32.4	14.568
19	23 12 35.00	2.3273	10 36 37.1	14.088	19	0 58 38.23	2.1187	1 5 5.7	14.543
20	23 14 54.46	2.3214	10 22 30.3	14.137	20	1 0 45.27	2.1161	1 19 37.5	14.517
21	23 17 13.57	2.3156	10 8 20.6	14.185	21	1 2 52.16	2.1136	1 34 7.7	14.489
22	23 19 32.33	2.3098	9 54 8.1	14.231	22	1 4 58.91	2.1112	1 48 36.2	14.461
23	23 21 50.75	2.3041	9 39 52.9	14.274	23	1 7 5.51	2.1088	2 3 3.0	14.431
24	23 24 8.82	2.2984	S. 9 25 35.2	14.316	24	1 9 11.97	2.1066	N. 2 17 27.9	14.399

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 5.					**THURSDAY 7.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	1 9 11.97	2.1066	N. 2 17 27.9	14.399	0	2 48 58.87	2.0743	N.12 53 19.3	11.742
1	1 11 18.30	2.1044	2 31 50.9	14.367	1	2 51 3.35	2.0750	13 5 1.5	11.665
2	1 13 24.50	2.1022	2 46 12.0	14.335	2	2 53 7.87	2.0757	13 16 39.1	11.587
3	1 15 30.57	2.1002	3 0 31.1	14.301	3	2 55 12.44	2.0765	13 28 12.0	11.510
4	1 17 36.52	2.0982	3 14 48.1	14.265	4	2 57 17.05	2.0773	13 39 40.3	11.432
5	1 19 42.36	2.0963	3 29 2.9	14.228	5	2 59 21.71	2.0782	13 51 3.9	11.353
6	1 21 48.08	2.0945	3 43 15.4	14.190	6	3 1 26.43	2.0791	14 2 22.7	11.273
7	1 23 53.70	2.0927	3 57 25.7	14.152	7	3 3 31.20	2.0800	14 13 36.7	11.192
8	1 25 59.21	2.0910	4 11 33.6	14.112	8	3 5 36.03	2.0809	14 24 45.8	11.111
9	1 28 4.62	2.0894	4 25 39.1	14.071	9	3 7 40.91	2.0818	14 35 50.0	11.029
10	1 30 9.94	2.0878	4 39 42.1	14.028	10	3 9 45.85	2.0829	14 46 49.3	10.947
11	1 32 15.16	2.0862	4 53 42.5	13.985	11	3 11 50.86	2.0841	14 57 43.7	10.865
12	1 34 20.29	2.0848	5 7 40.3	13.941	12	3 13 55.94	2.0852	15 8 33.1	10.781
13	1 36 25.34	2.0835	5 21 35.4	13.896	13	3 16 1.08	2.0863	15 19 17.4	10.696
14	1 38 30.31	2.0822	5 35 27.8	13.850	14	3 18 6.29	2.0674	15 29 56.6	10.610
15	1 40 35.21	2.0810	5 49 17.4	13.802	15	3 20 11.57	2.0886	15 40 30.6	10.524
16	1 42 40.03	2.0798	6 3 4.1	13.754	16	3 22 16.92	2.0898	15 50 59.5	10.437
17	1 41 44.79	2.0787	6 16 47.9	13.706	17	3 24 22.35	2.0911	16 1 23.1	10.350
18	1 46 49.48	2.0777	6 30 28.8	13.657	18	3 26 27.86	2.0924	16 11 41.5	10.262
19	1 48 54.11	2.0768	6 44 6.7	13.605	19	3 28 33.44	2.0937	16 21 54.6	10.174
20	1 50 58.69	2.0759	6 57 41.4	13.552	20	3 30 39.10	2.0951	16 32 2.4	10.085
21	1 53 3.22	2.0751	7 11 12.9	13.498	21	3 32 44.85	2.0965	16 42 4.8	9.995
22	1 55 7.70	2.0743	7 24 41.2	13.445	22	3 34 50.68	2.0978	16 52 1.8	9.904
23	1 57 12.14	2.0736	N. 7 38 6.3	13.391	23	3 36 56.59	2.0992	N.17 1 53.3	9.813
	WEDNESDAY 6.					**FRIDAY 8.**			
0	1 59 16.53	2.0729	N. 7 51 28.1	13.335	0	3 39 2.59	2.1007	N.17 11 39.4	9.722
1	2 1 20.89	2.0724	8 4 46.5	13.278	1	3 41 8.67	2.1021	17 21 19.9	9.629
2	2 3 25.22	2.0719	8 18 1.5	13.221	2	3 43 14.84	2.1036	17 30 54.9	9.536
3	2 5 29.52	2.0714	8 31 13.0	13.162	3	3 45 21.10	2.1051	17 40 24.3	9.443
4	2 7 33.79	2.0709	8 44 20.9	13.102	4	3 47 27.45	2.1066	17 49 48.1	9.349
5	2 9 38.03	2.0705	8 57 25.2	13.042	5	3 49 33.89	2.1081	17 59 6.2	9.254
6	2 11 42.25	2.0703	9 10 25.9	12.981	6	3 51 40.42	2.1097	18 8 18.6	9.159
7	2 13 46.46	2.0701	9 23 22.9	12.919	7	3 53 47.05	2.1112	18 17 25.3	9.063
8	2 15 50.66	2.0699	9 36 16.2	12.857	8	3 55 53.77	2.1127	18 26 26.2	8.967
9	2 17 54.85	2.0698	9 49 5.7	12.793	9	3 58 0.58	2.1143	18 35 21.3	8.870
10	2 19 59.04	2.0698	10 1 51.4	12.728	10	4 0 7.49	2.1159	18 44 10.6	8.772
11	2 22 3.23	2.0697	10 14 33.1	12.663	11	4 2 14.49	2.1175	18 52 54.0	8.674
12	2 24 7.41	2.0697	10 27 10.9	12.597	12	4 4 21.59	2.1191	19 1 31.5	8.575
13	2 26 11.60	2.0699	10 39 44.7	12.530	13	4 6 28.79	2.1207	19 10 3.0	8.476
14	2 28 15.80	2.0701	10 52 14.5	12.462	14	4 8 36.08	2.1223	19 18 28.6	8.377
15	2 30 20.01	2.0703	11 4 40.2	12.393	15	4 10 43.47	2.1240	19 26 48.2	8.277
16	2 32 24.23	2.0705	11 17 1.7	12.323	16	4 12 50.96	2.1256	19 35 1.8	8.176
17	2 34 28.47	2.0708	11 29 19.0	12.253	17	4 14 58.55	2.1272	19 43 9.3	8.074
18	2 36 32.73	2.0712	11 41 32.1	12.182	18	4 17 6.23	2.1288	19 51 10.7	7.972
19	2 38 37.01	2.0716	11 53 40.9	12.111	19	4 19 14.01	2.1305	19 59 6.0	7.870
20	2 40 41.32	2.0721	12 5 45.4	12.038	20	4 21 21.89	2.1322	20 6 55.1	7.767
21	2 42 45.66	2.0726	12 17 45.5	11.965	21	4 23 29.87	2.1338	20 14 38.0	7.663
22	2 44 50.03	2.0731	12 29 41.2	11.892	22	4 25 37.95	2.1354	20 22 14.7	7.559
23	2 46 54.43	2.0737	12 41 32.5	11.817	23	4 27 46.12	2.1370	20 29 45.1	7.455
24	2 48 58.87	2.0743	N.12 53 19.3	11.742	24	4 29 54.39	2.1387	N.20 37 9.3	7.351

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	4 29 54.39	2.1387	N.20 37 9.3	7.351
1	4 32 2.76	2.1403	20 44 27.2	7.245
2	4 34 11.22	2.1418	20 51 38.7	7.139
3	4 36 19.78	2.1434	20 58 43.9	7.033
4	4 38 28.43	2.1450	21 5 42.7	6.926
5	4 40 37.18	2.1467	21 12 35.1	6.819
6	4 42 46.03	2.1483	21 19 21.0	6.712
7	4 44 54.97	2.1498	21 26 0.5	6.604
8	4 47 4.00	2.1513	21 32 33.5	6.495
9	4 49 13.13	2.1529	21 38 59.9	6.386
10	4 51 22.35	2.1543	21 45 19.8	6.277
11	4 53 31.65	2.1557	21 51 33.1	6.167
12	4 55 41.04	2.1572	21 57 39.9	6.057
13	4 57 50.52	2.1587	22 3 40.0	5.947
14	5 0 0.08	2.1601	22 9 33.5	5.836
15	5 2 9.73	2.1615	22 15 20.3	5.724
16	5 4 19.46	2.1629	22 21 0.4	5.613
17	5 6 29.28	2.1643	22 26 33.8	5.501
18	5 8 39.18	2.1656	22 32 0.5	5.388
19	5 10 49.16	2.1669	22 37 20.4	5.276
20	5 12 59.21	2.1682	22 42 33.6	5.163
21	5 15 9.34	2.1694	22 47 40.0	5.050
22	5 17 19.54	2.1707	22 52 39.6	4.936
23	5 19 29.82	2.1719	N.22 57 32.3	4.821

SUNDAY 10

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	5 21 40.17	2.1730	N.23 2 18.1	4.706
1	5 23 50.58	2.1741	23 6 57.0	4.592
2	5 26 1.06	2.1752	23 11 29.1	4.477
3	5 28 11.61	2.1763	23 15 54.3	4.362
4	5 30 22.22	2.1773	23 20 12.6	4.247
5	5 32 32.89	2.1783	23 24 23.9	4.131
6	5 34 43.62	2.1792	23 28 28.3	4.015
7	5 36 54.40	2.1802	23 32 25.7	3.899
8	5 39 5.24	2.1811	23 36 16.1	3.783
9	5 41 16.13	2.1819	23 39 59.6	3.666
10	5 43 27.07	2.1827	23 43 36.0	3.548
11	5 45 38.05	2.1834	23 47 5.4	3.431
12	5 47 49.08	2.1841	23 50 27.7	3.313
13	5 50 0.15	2.1848	23 53 43.0	3.196
14	5 52 11.26	2.1854	23 56 51.2	3.078
15	5 54 22.40	2.1860	23 59 52.4	2.961
16	5 56 33.58	2.1866	24 2 46.5	2.843
17	5 58 44.79	2.1870	24 5 33.5	2.725
18	6 0 56.02	2.1874	24 8 13.5	2.607
19	6 3 7.28	2.1878	24 10 46.3	2.488
20	6 5 18.56	2.1882	24 13 12.0	2.369
21	6 7 29.87	2.1886	24 15 30.6	2.251
22	6 9 41.19	2.1888	24 17 42.1	2.132
23	6 11 52.52	2.1889	24 19 46.4	2.012
24	6 14 3.86	2.1891	N.24 21 43.6	1.893

MONDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	6 14 3.86	2.1891	N.24 21 43.6	1.893
1	6 16 15.21	2.1892	24 23 33.6	1.774
2	6 18 26.56	2.1893	24 25 16.5	1.656
3	6 20 37.92	2.1893	24 26 52.3	1.537
4	6 22 49.28	2.1893	24 28 20.9	1.418
5	6 25 0.63	2.1892	24 29 42.4	1.299
6	6 27 11.98	2.1891	24 30 56.8	1.180
7	6 29 23.32	2.1888	24 32 4.0	1.060
8	6 31 34.64	2.1885	24 33 4.0	0.941
9	6 33 45.94	2.1882	24 33 56.9	0.822
10	6 35 57.22	2.1878	24 34 42.6	0.703
11	6 38 8.48	2.1874	24 35 21.2	0.584
12	6 40 19.71	2.1869	24 35 52.7	0.465
13	6 42 30.91	2.1864	24 36 17.0	0.346
14	6 44 42.08	2.1859	24 36 34.2	0.227
15	6 46 53.22	2.1853	24 36 44.3	+ 0.108
16	6 49 4.32	2.1847	24 36 47.2	− 0.011
17	6 51 15.38	2.1839	24 36 43.0	0.129
18	6 53 26.39	2.1831	24 36 31.7	0.248
19	6 55 37.35	2.1822	24 36 13.3	0.366
20	6 57 48.26	2.1814	24 35 47.8	0.483
21	6 59 59.12	2.1805	24 35 15.3	0.601
22	7 2 9.92	2.1794	24 34 35.7	0.719
23	7 4 20.65	2.1783	N.24 33 49.0	0.837

TUESDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	7 6 31.32	2.1773	N.24 32 55.2	0.955
1	7 8 41.93	2.1762	24 31 54.4	1.072
2	7 10 52.46	2.1749	24 30 46.6	1.188
3	7 13 2.92	2.1736	24 29 31.8	1.305
4	7 15 13.30	2.1723	24 28 10.0	1.421
5	7 17 23.60	2.1710	24 26 41.2	1.537
6	7 19 33.82	2.1696	24 25 5.5	1.653
7	7 21 43.95	2.1681	24 23 22.8	1.770
8	7 23 53.99	2.1667	24 21 33.1	1.886
9	7 26 3.95	2.1652	24 19 36.5	2.001
10	7 28 13.81	2.1635	24 17 33.0	2.116
11	7 30 23.57	2.1618	24 15 22.6	2.230
12	7 32 33.23	2.1601	24 13 5.4	2.344
13	7 34 42.79	2.1584	24 10 41.3	2.458
14	7 36 52.24	2.1566	24 8 10.4	2.572
15	7 39 1.58	2.1547	24 5 32.6	2.686
16	7 41 10.81	2.1528	24 2 48.1	2.799
17	7 43 19.92	2.1508	23 59 56.8	2.911
18	7 45 28.91	2.1488	23 56 58.8	3.023
19	7 47 37.78	2.1468	23 53 54.0	3.135
20	7 49 46.53	2.1448	23 50 42.6	3.246
21	7 51 55.16	2.1427	23 47 24.5	3.357
22	7 54 3.66	2.1406	23 43 59.7	3.468
23	7 56 12.03	2.1384	23 40 28.3	3.578
24	7 58 20.26	2.1361	N.23 36 50.3	3.688

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	7 58 20.26	2.1361	N.23 36 50.3	3.688
1	8 0 28.36	2.1338	23 33 5.7	3.797
2	8 2 36.32	2.1315	23 29 14.6	3.906
3	8 4 44.14	2.1292	23 25 17.0	4.014
4	8 6 51.82	2.1268	23 21 12.9	4.122
5	8 8 59.36	2.1244	23 17 2.3	4.230
6	8 11 6.75	2.1219	23 12 45.3	4.337
7	8 13 13.99	2.1194	23 8 21.9	4.443
8	8 15 21.08	2.1169	23 3 52.1	4.549
9	8 17 28.02	2.1144	22 59 16.0	4.655
10	8 19 34.81	2.1118	22 54 33.5	4.760
11	8 21 41.44	2.1092	22 49 44.8	4.864
12	8 23 47.91	2.1065	22 44 49.8	4.968
13	8 25 54.22	2.1038	22 39 48.6	5.072
14	8 28 0.37	2.1011	22 34 41.2	5.175
15	8 30 6.36	2.0984	22 29 27.6	5.277
16	8 32 12.18	2.0957	22 24 7.9	5.379
17	8 34 17.84	2.0929	22 18 42.1	5.480
18	8 36 23.33	2.0901	22 13 10.3	5.581
19	8 38 28.65	2.0872	22 7 32.4	5.681
20	8 40 33.80	2 0844	22 1 48.6	5.780
21	8 42 38.78	2.0815	21 55 58.8	5.879
22	8 44 43.58	2.0786	21 50 3.1	5.977
23	8 46 48.21	2.0757	N.21 44 1.5	6.075

THURSDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	8 48 52.67	2.0728	N.21 37 54.1	6.172
1	8 50 56.95	2.0698	21 31 40.9	6.268
2	8 53 1.05	2.0669	21 25 21.9	6.365
3	8 55 4.98	2.0640	21 18 57.1	6.461
4	8 57 8.73	2.0610	21 12 26.6	6.555
5	8 59 12.30	2.0579	21 5 50.5	6.648
6	9 1 15.68	2.0549	20 59 8.8	6.742
7	9 3 18.88	2.0519	20 52 21.5	6.835
8	9 5 21.91	2.0489	20 45 28.6	6.927
9	9 7 24.75	2.0458	20 38 30.2	7.018
10	9 9 27.41	2.0428	20 31 26.4	7.108
11	9 11 29.89	2.0397	20 24 17.2	7.199
12	9 13 32.18	2.0367	20 17 2.5	7.289
13	9 15 34.29	2.0336	20 9 42.5	7.378
14	9 17 36.21	2.0305	20 2 17.2	7.466
15	9 19 37.95	2.0274	19 54 46.6	7.553
16	9 21 39.50	2.0243	19 47 10.8	7.640
17	9 23 40.87	2.0213	19 39 29.8	7.726
18	9 25 42.06	2.0182	19 31 43.7	7.811
19	9 27 43.06	2.0152	19 23 52.5	7.896
20	9 29 43.88	2.0122	19 15 56.2	7.980
21	9 31 44.52	2.0091	19 7 54.9	8.064
22	9 33 44.97	2.0060	18 59 48.6	8.147
23	9 35 45.24	2.0029	18 51 37.3	8.229
24	9 37 45.32	1.9998	N.18 43 21.1	8.310

FRIDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	9 37 45.32	1.9998	N.18 43 21.1	8.310
1	9 39 45.22	1.9968	18 35 0.1	8.390
2	9 41 44.94	1.9938	18 26 34.3	8.470
3	9 43 44.48	1.9908	18 18 3.7	8.549
4	9 45 43.84	1.9878	18 9 28.4	8.628
5	9 47 43.02	1.9847	18 0 48.4	8.706
6	9 49 42.01	1.9817	17 52 3.7	8.783
7	9 51 40.83	1.9788	17 43 14.4	8.859
8	9 53 39.47	1.9758	17 34 20.6	8.934
9	9 55 37.93	1.9729	17 25 22.3	9.009
10	9 57 36.22	1.9700	17 16 19.5	9.084
11	9 59 34.33	1.9670	17 7 12.2	9.158
12	10 1 32.26	1.9641	16 58 0.5	9.231
13	10 3 30.02	1.9612	16 48 44.5	9.303
14	10 5 27.61	1.9584	16 39 24.2	9.374
15	10 7 25.03	1.9556	16 29 59.6	9.445
16	10 9 22.28	1.9527	16 20 30.8	9.514
17	10 11 19.36	1.9499	16 10 57.9	9.582
18	10 13 16.27	1.9472	16 1 20.9	9.651
19	10 15 13.02	1.9444	15 51 39.8	9.719
20	10 17 9.60	1.9417	15 41 54.6	9.787
21	10 19 6.02	1.9390	15 32 5.4	9.853
22	10 21 2.28	1.9363	15 22 12.2	9.918
23	10 22 58.38	1.9336	N.15 12 15.2	9.983

SATURDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	10 24 54.31	1.9309	N.15 2 14.3	10.047
1	10 26 50.09	1.9284	14 52 9.6	10.110
2	10 28 45.72	1.9258	14 42 1.1	10.173
3	10 30 41.19	1.9232	14 31 48.8	10.236
4	10 32 36.51	1.9207	14 21 32.8	10.297
5	10 34 31.68	1.9183	14 11 13.2	10.357
6	10 36 26.71	1.9159	14 0 50.0	10.417
7	10 38 21.59	1.9134	13 50 23.2	10.476
8	10 40 16.32	1.9110	13 39 52.9	10.534
9	10 42 10.91	1.9087	13 29 19.2	10.591
10	10 44 5.36	1.9064	13 18 42.0	10.648
11	10 45 59.68	1.9042	13 8 1.4	10.705
12	10 47 53.86	1.9019	12 57 17.4	10.761
13	10 49 47.91	1.8997	12 46 30.1	10.815
14	10 51 41.83	1.8975	12 35 39.6	10.868
15	10 53 35.61	1.8953	12 24 45.9	10.921
16	10 55 29.27	1.8932	12 13 49.0	10.974
17	10 57 22.80	1.8912	12 2 49.0	11.026
18	10 59 16.21	1.8892	11 51 45.9	11.077
19	11 1 9.50	1.8872	11 40 39.7	11.127
20	11 3 2.68	1.8853	11 29 30.6	11.177
21	11 4 55.74	1.8834	11 18 18.5	11.226
22	11 6 48.68	1.8815	11 7 3.5	11.274
23	11 8 41.52	1.8797	10 55 45.6	11.322
24	11 10 34.25	1.8779	N.10 44 24.8	11.370

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 17.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	11 10 34.25	1.8779	N.10 44 24.8	11.370
1	11 12 26.87	1.8762	10 33 1.2	11.415
2	11 14 19.39	1.8746	10 21 35.0	11.459
3	11 16 11.82	1.8730	10 10 6.1	11.503
4	11 18 4.15	1.8713	9 58 34.6	11.548
5	11 19 56.38	1.8697	9 47 0.4	11.592
6	11 21 48.52	1.8682	9 35 23.6	11.634
7	11 23 40.57	1.8668	9 23 44.3	11.675
8	11 25 32.54	1.8654	9 12 2.6	11.716
9	11 27 24.42	1.8640	9 0 18.4	11.757
10	11 29 16.22	1.8627	8 48 31.8	11.796
11	11 31 7.95	1.8615	8 36 42.9	11.835
12	11 32 59.60	1.8603	8 24 51.6	11.873
13	11 34 51.18	1.8591	8 12 58.1	11.910
14	11 36 42.69	1.8580	8 1 2.4	11.947
15	11 38 34.14	1.8570	7 49 4.5	11.983
16	11 40 25.53	1.8559	7 37 4.4	12.018
17	11 42 16.85	1.8548	7 25 2.3	12.053
18	11 44 8.11	1.8539	7 12 58.1	12.087
19	11 45 59.32	1.8531	7 0 51.9	12.119
20	11 47 50.49	1.8524	6 48 43.8	12.151
21	11 49 41.61	1.8516	6 36 33.8	12.183
22	11 51 32.68	1.8508	6 24 21.9	12.214
23	11 53 23.71	1.8502	N. 6 12 8.1	12.245

MONDAY 18.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	11 55 14.71	1.8496	N. 5 59 52.5	12.274
1	11 57 5.67	1.8491	5 47 35.2	12.303
2	11 58 56.60	1.8487	5 35 16.2	12.331
3	12 0 47.51	1.8482	5 22 55.5	12.358
4	12 2 38.39	1.8478	5 10 33.2	12.384
5	12 4 29.25	1.8475	4 58 9.4	12.410
6	12 6 20.09	1.8473	4 45 44.0	12.436
7	12 8 10.92	1.8471	4 33 17.1	12.460
8	12 10 1.74	1.8469	4 20 48.8	12.484
9	12 11 52.55	1.8468	4 8 19.1	12.507
10	12 13 43.36	1.8468	3 55 48.0	12.529
11	12 15 34.17	1.8468	3 43 15.6	12.551
12	12 17 24.98	1.8469	3 30 41.9	12.572
13	12 19 15.80	1.8471	3 18 7.0	12.592
14	12 21 6.63	1.8473	3 5 30.9	12.611
15	12 22 57.47	1.8475	2 52 53.7	12.629
16	12 24 48.33	1.8479	2 40 15.4	12.647
17	12 26 39.22	1.8483	2 27 36.1	12.664
18	12 28 30.13	1.8487	2 14 55.7	12.681
19	12 30 21.07	1.8492	2 2 14.3	12.697
20	12 32 12.04	1.8497	1 49 32.0	12.712
21	12 34 3.04	1.8504	1 36 48.9	12.725
22	12 35 54.08	1.8511	1 24 5.0	12.738
23	12 37 45.17	1.8518	1 11 20.3	12.751
24	12 39 36.30	1.8526	N. 0 58 34.8	12.764

TUESDAY 19.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	12 39 36.30	1.8526	N. 0 58 34.8	12.764
1	12 41 27.48	1.8535	0 45 48.6	12.775
2	12 43 18.72	1.8545	0 33 1.8	12.786
3	12 45 10.02	1.8555	0 20 14.3	12.796
4	12 47 1.38	1.8566	N. 0 7 26.3	12.804
5	12 48 52.81	1.8577	S. 0 5 22.2	12.812
6	12 50 44.31	1.8589	0 18 11.2	12.820
7	12 52 35.88	1.8602	0 31 0.6	12.827
8	12 54 27.53	1.8615	0 43 50.4	12.833
9	12 56 19.26	1.8628	0 56 40.5	12.838
10	12 58 11.07	1.8642	1 9 30.9	12.843
11	13 0 2.97	1.8658	1 22 21.6	12.847
12	13 1 54.97	1.8674	1 35 12.5	12.849
13	13 3 47.06	1.8691	1 48 3.5	12.851
14	13 5 39.26	1.8708	2 0 54.6	12.852
15	13 7 31.56	1.8726	2 13 45.8	12.853
16	13 9 23.97	1.8744	2 26 37.0	12.852
17	13 11 16.49	1.8763	2 39 28.1	12.851
18	13 13 9.13	1.8783	2 52 19.1	12.849
19	13 15 1.89	1.8804	3 5 10.0	12.847
20	13 16 54.78	1.8825	3 18 0.7	12.843
21	13 18 47.79	1.8847	3 30 51.2	12.839
22	13 20 40.94	1.8870	3 43 41.4	12.834
23	13 22 34.23	1.8893	S. 3 56 31.3	12.828

WEDNESDAY 20.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	13 24 27.66	1.8917	S. 4 9 20.8	12.822
1	13 26 21.23	1.8941	4 22 9.9	12.814
2	13 28 14.95	1.8967	4 34 58.5	12.806
3	13 30 8.83	1.8993	4 47 46.6	12.797
4	13 32 2.87	1.9020	5 0 34.1	12.786
5	13 33 57.07	1.9047	5 13 20.9	12.774
6	13 35 51.43	1.9074	5 26 7.0	12.763
7	13 37 45.96	1.9103	5 38 52.4	12.751
8	13 39 40.67	1.9133	5 51 37.1	12.737
9	13 41 35.56	1.9163	6 4 20.9	12.722
10	13 43 30.63	1.9194	6 17 3.8	12.707
11	13 45 25.89	1.9226	6 29 45.8	12.691
12	13 47 21.34	1.9258	6 42 26.8	12.674
13	13 49 16.98	1.9291	6 55 6.7	12.657
14	13 51 12.83	1.9325	7 7 45.6	12.638
15	13 53 8.88	1.9359	7 20 23.3	12.618
16	13 55 5.14	1.9394	7 32 59.8	12.597
17	13 57 1.61	1.9429	7 45 35.0	12.576
18	13 58 58.29	1.9466	7 58 8.9	12.553
19	14 0 55.20	1.9503	8 10 41.4	12.529
20	14 2 52.33	1.9541	8 23 12.4	12.504
21	14 4 49.69	1.9579	8 35 41.9	12.479
22	14 6 47.28	1.9618	8 48 9.9	12.453
23	14 8 45.11	1.9658	9 0 36.3	12.427
24	14 10 43.18	1.9698	S. 9 13 1.1	12.399

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	14 10 43.18	1.9698	S. 9 13 1.1	12.399
1	14 12 41.49	1.9740	9 25 24.2	12.370
2	14 14 40.06	1.9782	9 37 45.5	12.339
3	14 16 38.88	1.9825	9 50 4.9	12.307
4	14 18 37.96	1.9868	10 2 22.4	12.275
5	14 20 37.30	1.9912	10 14 37.9	12.242
6	14 22 36.91	1.9957	10 26 51.4	12.208
7	14 24 36.79	2.0002	10 39 2.8	12.173
8	14 26 36.94	2.0048	10 51 12.1	12.137
9	14 28 37.37	2.0096	11 3 19.2	12.099
10	14 30 38.09	2.0143	11 15 24.0	12.061
11	14 32 39.09	2.0191	11 27 26.5	12.022
12	14 34 40.38	2.0240	11 39 26.6	11.981
13	14 36 41.97	2.0290	11 51 24.2	11.939
14	14 38 43.86	2.0339	12 3 19.3	11.897
15	14 40 46.04	2.0389	12 15 11.8	11.853
16	14 42 48.53	2.0441	12 27 1.7	11.808
17	14 44 51.34	2.0494	12 38 48.8	11.762
18	14 46 54.46	2.0547	12 50 33.1	11.715
19	14 48 57.90	2.0600	13 2 14.6	11.667
20	14 51 1.66	2.0654	13 13 53.1	11.617
21	14 53 5.75	2.0709	13 25 28.6	11.567
22	14 55 10.17	2.0764	13 37 1.1	11.515
23	14 57 14.92	2.0819	S. 13 48 30.4	11.462

FRIDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	14 59 20.00	2.0876	S. 13 59 56.5	11.407
1	15 1 25.43	2.0933	14 11 19.3	11.352
2	15 3 31.20	2.0991	14 22 38.8	11.296
3	15 5 37.32	2.1049	14 33 54.8	11.238
4	15 7 43.79	2.1108	14 45 7.3	11.179
5	15 9 50.62	2.1167	14 56 16.3	11.120
6	15 11 57.80	2.1227	15 7 21.7	11.058
7	15 14 5.35	2.1288	15 18 23.3	10.995
8	15 16 13.26	2.1349	15 29 21.1	10.932
9	15 18 21.54	2.1411	15 40 15.1	10.866
10	15 20 30.19	2.1474	15 51 5.1	10.799
11	15 22 39.22	2.1537	16 1 51.0	10.732
12	15 24 48.63	2.1600	16 12 32.9	10.663
13	15 26 58.42	2.1663	16 23 10.6	10.592
14	15 29 8.59	2.1727	16 33 44.0	10.521
15	15 31 19.14	2.1791	16 44 13.1	10.447
16	15 33 30.08	2.1856	16 54 37.7	10.373
17	15 35 41.42	2.1922	17 4 57.9	10.298
18	15 37 53.15	2.1988	17 15 13.5	10.222
19	15 40 5.28	2.2055	17 25 24.5	10.143
20	15 42 17.81	2.2122	17 35 30.7	10.062
21	15 44 30.74	2.2189	17 45 32.0	9.981
22	15 46 44.08	2.2257	17 55 28.4	9.899
23	15 48 57.83	2.2325	18 5 19.9	9.816
24	15 51 11.98	2.2393	S. 18 15 6.3	9.730

SATURDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	15 51 11.98	2.2393	S. 18 15 6.3	9.730
1	15 53 26.54	2.2462	18 24 47.5	9.643
2	15 55 41.52	2.2532	18 34 23.5	9.555
3	15 57 56.92	2.2601	18 43 54.1	9.465
4	16 0 12.73	2.2670	18 53 19.3	9.374
5	16 2 28.96	2.2739	19 2 39.0	9.282
6	16 4 45.60	2.2809	19 11 53.2	9.189
7	16 7 2.67	2.2880	19 21 1.7	9.093
8	16 9 20.16	2.2950	19 30 4.4	8.996
9	16 11 38.07	2.3021	19 39 1.2	8.897
10	16 13 56.41	2.3092	19 47 52.1	8.798
11	16 16 15.17	2.3163	19 56 37.0	8.697
12	16 18 34.36	2.3234	20 5 15.7	8.594
13	16 20 53.98	2.3305	20 13 48.2	8.490
14	16 23 14.02	2.3376	20 22 14.5	8.385
15	16 25 34.49	2.3447	20 30 34.4	8.278
16	16 27 55.39	2.3519	20 38 47.8	8.169
17	16 30 16.72	2.3591	20 46 54.7	8.059
18	16 32 38.48	2.3662	20 54 54.9	7.947
19	16 35 0.67	2.3733	21 2 48.4	7.834
20	16 37 23.28	2.3804	21 10 35.0	7.719
21	16 39 46.32	2.3876	21 18 14.7	7.603
22	16 42 9.79	2.3947	21 25 47.4	7.486
23	16 44 33.68	2.4017	S. 21 33 13.0	7.367

SUNDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	16 46 58.00	2.4088	S. 21 40 31.4	7.246
1	16 49 22.74	2.4158	21 47 42.5	7.124
2	16 51 47.90	2.4229	21 54 46.3	7.001
3	16 54 13.49	2.4300	22 1 42.6	6.875
4	16 56 39.50	2.4369	22 8 31.3	6.748
5	16 59 5.92	2.4438	22 15 12.4	6.621
6	17 1 32.76	2.4507	22 21 45.8	6.492
7	17 4 0.01	2.4576	22 28 11.4	6.361
8	17 6 27.67	2.4645	22 34 29.1	6.228
9	17 8 55.75	2.4713	22 40 38.8	6.094
10	17 11 24.23	2.4780	22 46 40.4	5.958
11	17 13 53.11	2.4847	22 52 33.8	5.822
12	17 16 22.39	2.4913	22 58 19.0	5.684
13	17 18 52.07	2.4979	23 3 55.9	5.544
14	17 21 22.14	2.5045	23 9 24.3	5.402
15	17 23 52.61	2.5110	23 14 44.2	5.260
16	17 26 23.46	2.5173	23 19 55.5	5.116
17	17 28 54.69	2.5237	23 24 58.1	4.971
18	17 31 26.30	2.5300	23 29 52.0	4.825
19	17 33 58.29	2.5362	23 34 37.1	4.677
20	17 36 30.64	2.5423	23 39 13.2	4.527
21	17 39 3.36	2.5483	23 43 40.3	4.377
22	17 41 36.44	2.5543	23 47 58.4	4.225
23	17 44 9.88	2.5602	23 52 7.3	4.071
24	17 46 43.67	2.5660	S. 23 56 6.9	3.916

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 25.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	17 46 43.67	2.5660	S.23 56 6.9	3.916
1	17 49 17.80	2.5717	23 59 57.2	3.761
2	17 51 52.27	2.5773	24 3 38.2	3.604
3	17 54 27.08	2.5828	24 7 9.7	3.446
4	17 57 2.21	2.5882	24 10 31.7	3.287
5	17 59 37.66	2.5935	24 13 44.1	3.126
6	18 2 13.43	2.5987	24 16 46.8	2.963
7	18 4 49.51	2.6038	24 19 39.7	2.800
8	18 7 25.89	2.6087	24 22 22.8	2.637
9	18 10 2.56	2.6136	24 24 56.1	2.473
10	18 12 39.52	2.6184	24 27 19.5	2.307
11	18 15 16.77	2.6232	24 29 32.9	2.139
12	18 17 54.30	2.6277	24 31 36.2	1.971
13	18 20 32.09	2.6320	24 33 29.4	1.802
14	18 23 10.14	2.6362	24 35 12.4	1.632
15	18 25 48.44	2.6403	24 36 45.2	1.461
16	18 28 26.98	2.6443	24 38 7.7	1.289
17	18 31 5.76	2.6482	24 39 19.9	1.117
18	18 33 44.77	2.6520	24 40 21.7	0.943
19	18 36 24.00	2.6556	24 41 13.1	0.769
20	18 39 3.44	2.6590	24 41 54.0	0.594
21	18 41 43.08	2.6623	24 42 24.4	0.419
22	18 44 22.92	2.6656	24 42 44.3	0.242
23	18 47 2.95	2.6686	S.24 42 53.5	– 0.065

TUESDAY 26.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	18 49 43.15	2.6714	S.24 42 52.1	+ 0.112
1	18 52 23.52	2.6742	24 42 40.1	0.289
2	18 55 4.05	2.6768	24 42 17.4	0.468
3	18 57 44.73	2.6792	24 41 43.9	0.648
4	19 0 25.55	2.6815	24 40 59.6	0.828
5	19 3 6.51	2.6837	24 40 4.5	1.008
6	19 5 47.59	2.6856	24 38 58.6	1.188
7	19 8 28.78	2.6874	24 37 41.9	1.368
8	19 11 10.08	2.6891	24 36 14.4	1.549
9	19 13 51.47	2.6906	24 34 36.0	1.730
10	19 46 32.95	2.6920	24 32 46.8	1.911
11	19 19 14.51	2.6932	24 30 46.7	2.092
12	19 21 56.13	2.6942	24 28 35.7	2.274
13	19 24 37.81	2.6951	24 26 13.8	2.456
14	19 27 19.54	2.6958	24 23 41.0	2.637
15	19 30 1.31	2.6964	24 20 57.3	2.819
16	19 32 43.11	2.6968	24 18 2.7	3.001
17	19 35 24.93	2.6971	24 14 57.2	3.183
18	19 38 6.76	2.6972	24 11 40.7	3.365
19	19 40 48.59	2.6972	24 8 13.4	3.546
20	19 43 30.42	2.6970	24 4 35.2	3.727
21	19 46 12.23	2.6966	24 0 46.2	3.907
22	19 48 54.01	2.6961	23 56 46.3	4.087
23	19 51 35.76	2.6954	23 52 35.7	4.267
24	19 54 17.46	2.6946	S.23 48 14.3	4.447

WEDNESDAY 27.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	19 54 17.46	2.6946	S.23 48 14.3	4.447
1	19 56 59.11	2.6937	23 43 42.1	4.626
2	19 59 40.70	2.6925	23 38 59.2	4.804
3	20 2 22.21	2.6912	23 34 5.6	4.983
4	20 5 3.64	2.6898	23 29 1.3	5.161
5	20 7 44.98	2.6882	23 23 46.3	5.338
6	20 10 26.23	2.6866	23 18 20.7	5.515
7	20 13 7.37	2.6847	23 12 44.5	5.690
8	20 15 48.39	2.6827	23 6 57.9	5.864
9	20 18 29.29	2.6806	23 1 0.8	6.038
10	20 21 10.06	2.6783	22 54 53.3	6.212
11	20 23 50.69	2.6760	22 48 35.4	6.384
12	20 26 31.18	2.6735	22 42 7.2	6.555
13	20 29 11.51	2.6708	22 35 28.8	6.726
14	20 31 51.67	2.6680	22 28 40.1	6.897
15	20 34 31.67	2.6652	22 21 41.2	7.066
16	20 37 11.49	2.6621	22 14 32.2	7.233
17	20 39 51.12	2.6589	22 7 13.3	7.398
18	20 42 30.56	2.6557	21 59 44.5	7.563
19	20 45 9.80	2.6523	21 52 5.8	7.726
20	20 47 48.84	2.6489	21 44 17.2	7.891
21	20 50 27.67	2.6453	21 36 18.9	8.052
22	20 53 6.28	2.6416	21 28 10.9	8.213
23	20 55 44.66	2.6378	S.21 19 53.3	8.372

THURSDAY 28.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	20 58 22.81	2.6339	S.21 11 26.3	8.529
1	21 1 0.73	2.6299	21 2 49.9	8.685
2	21 3 38.40	2.6258	20 54 4.1	8.841
3	21 6 15.82	2.6216	20 45 9.0	8.995
4	21 8 52.99	2.6173	20 36 4.7	9.147
5	21 11 29.90	2.6129	20 26 51.4	9.297
6	21 14 6.54	2.6084	20 17 29.1	9.446
7	21 16 42.91	2.6039	20 7 57.9	9.593
8	21 19 19.01	2.5994	19 58 17.9	9.739
9	21 21 54.84	2.5948	19 48 29.2	9.883
10	21 24 30.39	2.5901	19 38 31.9	10.026
11	21 27 5.65	2.5852	19 28 26.1	10.167
12	21 29 40.62	2.5803	19 18 11.9	10.306
13	21 32 15.29	2.5754	19 7 49.4	10.443
14	21 34 49.67	2.5705	18 57 18.7	10.580
15	21 37 23.75	2.5654	18 46 39.8	10.715
16	21 39 57.52	2.5603	18 35 52.9	10.847
17	21 42 30.98	2.5552	18 24 58.2	10.977
18	21 45 4.14	2.5500	18 13 55.7	11.106
19	21 47 36.98	2.5447	18 2 45.5	11.232
20	21 50 9.51	2.5395	17 51 27.8	11.357
21	21 52 41.72	2.5342	17 40 2.6	11.481
22	21 55 13.61	2.5288	17 28 30.1	11.602
23	21 57 45.18	2.5235	17 16 50.3	11.722
24	22 0 16.43	2.5181	S.17 5 3.4	11.840

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	22 0 16.43	2.5181	S. 17 5 3.4	11.840
1	22 2 47.35	2.5127	16 53 9.5	11.956
2	22 5 17.95	2.5072	16 41 8.7	12.069
3	22 7 48.22	2.5017	16 29 1.2	12.181
4	22 10 18.16	2.4962	16 16 47.0	12.291
5	22 12 47.77	2.4907	16 4 26.3	12.398
6	22 15 17.05	2.4852	15 51 59.2	12.504
7	22 17 46.00	2.4797	15 39 25.8	12.608
8	22 20 14.62	2.4742	15 26 46.2	12.710
9	22 22 42.91	2.4687	15 14 0.6	12.809
10	22 25 10.87	2.4632	15 1 9.1	12.908
11	22 27 38.49	2.4577	14 48 11.7	13.004
12	22 30 5.79	2.4522	14 35 8.6	13.097
13	22 32 32.76	2.4467	14 22 0.0	13.189
14	22 34 59.39	2.4411	14 8 45.9	13.280
15	22 37 25.69	2.4356	13 55 26.4	13.368
16	22 39 51.66	2.4301	13 42 1.7	13.453
17	22 42 17.30	2.4247	13 28 32.0	13.536
18	22 44 42.62	2.4192	13 14 57.4	13.617
19	22 47 7.61	2.4137	13 1 17.9	13.697
20	22 49 32.27	2.4083	12 47 33.7	13.776
21	22 51 56.61	2.4029	12 33 44.8	13.851
22	22 54 20.62	2.3975	12 19 51.5	13.924
23	22 56 44.31	2.3922	S. 12 5 53.9	13.996

SATURDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	22 59 7.69	2.3870	S. 11 51 52.0	14.066
1	23 1 30.75	2.3817	11 37 46.0	14.133
2	23 3 53.49	2.3764	11 23 36.0	14.198
3	23 6 15.92	2.3712	11 9 22.2	14.262
4	23 8 38.03	2.3660	10 55 4.6	14.323
5	23 10 59.84	2.3609	10 40 43.4	14.382
6	23 13 21.34	2.3558	10 26 18.7	14.440
7	23 15 42.54	2.3507	10 11 50.6	14.495
8	23 18 3.43	2.3457	9 57 19.3	14.548
9	23 20 24.02	2.3407	9 42 44.8	14.600
10	23 22 44.31	2.3358	9 28 7.3	14.649
11	23 25 4.31	2.3309	9 13 26.9	14.697
12	23 27 24.02	2.3261	8 58 43.6	14.743
13	23 29 43.44	2.3213	8 43 57.7	14.786
14	23 32 2.57	2.3165	8 29 9.3	14.827
15	23 34 21.42	2.3118	8 14 18.4	14.867
16	23 36 39.99	2.3072	7 59 25.2	14.905
17	23 38 58.28	2.3026	7 44 29.8	14.940
18	23 41 16.30	2.2981	7 29 32.4	14.973
19	23 43 34.05	2.2936	7 14 33.0	15.006
20	23 45 51.53	2.2891	6 59 31.7	15.037
21	23 48 8.74	2.2847	6 44 28.6	15.065
22	23 50 25.69	2.2803	6 29 23.9	15.091
23	23 52 42.38	2.2761	6 14 17.7	15.115
24	23 54 58.82	2.2719	S. 5 59 10.1	15.137

SUNDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	23 54 58.82	2.2719	S. 5 59 10.1	15.137
1	23 57 15.01	2.2678	5 44 1.2	15.158
2	23 59 30.95	2.2637	5 28 51.1	15.177
3	0 1 46.65	2.2597	5 13 40.0	15.193
4	0 4 2.11	2.2557	4 58 27.9	15.209
5	0 6 17.33	2.2518	4 43 14.9	15.223
6	0 8 32.32	2.2479	4 28 1.1	15.235
7	0 10 47.08	2.2441	4 12 46.7	15.244
8	0 13 1.62	2.2404	3 57 31.8	15.252
9	0 15 15.93	2.2368	3 42 16.4	15.259
10	0 17 30.03	2.2332	3 27 0.7	15.264
11	0 19 43.91	2.2296	3 11 44.7	15.267
12	0 21 57.58	2.2261	2 56 28.6	15.268
13	0 24 11.04	2.2227	2 41 12.5	15.267
14	0 26 24.30	2.2194	2 25 56.5	15.266
15	0 28 37.37	2.2162	2 10 40.6	15.263
16	0 30 50.25	2.2130	1 55 25.0	15.257
17	0 33 2.93	2.2098	1 40 9.8	15.250
18	0 35 15.42	2.2067	1 24 55.0	15.242
19	0 37 27.73	2.2037	1 9 40.8	15.231
20	0 39 39.86	2.2007	0 54 27.3	15.219
21	0 41 51.82	2.1979	0 39 14.5	15.206
22	0 44 3.61	2.1951	0 24 2.6	15.191
23	0 46 15.23	2.1923	S. 0 8 51.6	15.174

MONDAY, SEPTEMBER 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	0 48 26.68	2.1895	N. 0 6 18.3	15.156

PHASES OF THE MOON.

		d	h	m
☾ Last Quarter . .	Aug.	7	2	18.7
● New Moon		15	4	19.6
☽ First Quarter. . . .		23	1	19.7
○ Full Moon		29	16	35.0

		d	h
☾ Apogee	Aug.	14	4.3
☾ Perigee		28	21.5

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Antares	W.	69° 22′ 48″	1993	71° 16′ 34″	1997	73° 10′ 14″	2001	75° 3′ 47″	2006
	α Arietis	E.	79 14 5	2098	77 23 3	2103	75 32 9	2111	73 41 27	2120
	Aldebaran	E.	109 49 38	1980	107 55 32	1984	106 1 33	1989	104 7 41	1994
2	Antares	W.	84 29 2	2044	86 21 27	2054	88 13 36	2065	90 5 29	2076
	α Aquilæ	W.	46 27 21	3675	47 44 35	3590	49 3 20	3512	50 23 31	3444
	Jupiter	W.	26 29 15	2009	28 22 35	2016	30 15 44	2025	32 8 40	2034
	α Arietis	E.	64 31 43	2178	62 42 43	2194	60 54 6	2210	59 5 54	2229
	Aldebaran	E.	94 40 56	2033	92 48 14	2043	90 55 47	2054	89 3 37	2065
3	Antares	W.	99 20 17	2141	101 10 13	2156	102 59 47	2172	104 48 57	2188
	α Aquilæ	W.	57 20 36	3219	58 46 24	3191	60 12 44	3167	61 39 33	3148
	Jupiter	W.	41 29 18	2092	43 20 29	2105	45 11 20	2120	47 1 49	2134
	α Arietis	E.	50 12 15	2339	48 27 13	2369	46 42 54	2398	44 59 15	2428
	Aldebaran	E.	79 47 23	2130	77 57 10	2145	76 7 20	2160	74 17 53	2176
4	α Aquilæ	W.	68 58 3	3100	70 26 13	3098	71 54 25	3099	73 22 36	3101
	Jupiter	W.	56 8 30	2213	57 56 38	2230	59 44 21	2247	61 31 38	2264
	Aldebaran	E.	65 16 36	2259	63 29 36	2277	61 43 2	2295	59 56 55	2313
	Sun	E.	129 9 5	2561	127 29 16	2579	125 49 52	2597	124 10 53	2616
5	α Aquilæ	W.	80 42 1	3139	82 9 23	3152	83 36 30	3165	85 3 21	3179
	Jupiter	W.	70 21 40	2353	72 6 23	2371	73 50 40	2389	75 34 31	2407
	Fomalhaut	W.	46 10 30	2733	47 46 26	2733	49 22 22	2735	50 58 15	2738
	α Pegasi	W.	34 19 52	4012	35 31 20	3894	36 44 46	3795	37 59 53	3710
	Aldebaran	E.	51 13 0	2407	49 29 35	2426	47 46 38	2445	46 4 7	2465
	Sun	E.	116 2 19	2711	114 25 54	2730	112 49 53	2749	111 14 19	2768
6	α Aquilæ	W.	92 12 54	3267	93 37 44	3287	95 2 11	3309	96 26 12	3331
	Jupiter	W.	84 7 23	2495	85 48 43	2513	87 29 38	2531	89 10 9	2548
	Fomalhaut	W.	58 56 0	2774	60 31 2	2783	62 5 52	2795	63 40 27	2805
	α Pegasi	W.	44 34 6	3440	45 55 37	3407	47 17 44	3380	48 40 23	3358
	Aldebaran	E.	37 38 30	2564	35 58 46	2585	34 19 30	2605	32 40 42	2626
	Sun	E.	103 22 47	2865	101 49 43	2885	100 17 4	2904	98 44 49	2922
7	α Aquilæ	W.	103 19 36	3455	104 40 50	3483	106 1 33	3513	107 21 43	3542
	Jupiter	W.	97 26 53	2630	99 5 7	2646	100 42 59	2662	102 20 30	2677
	Fomalhaut	W.	71 29 43	2865	73 2 47	2877	74 35 35	2890	76 8 7	2903
	α Pegasi	W.	55 38 58	3289	57 3 22	3282	58 27 55	3278	59 52 31	3275
	Sun	E.	91 9 23	3012	89 39 25	3029	88 9 49	3046	86 40 33	3063
8	Jupiter	W.	110 23 5	2750	111 58 39	2763	113 33 55	2776	115 8 54	2789
	Fomalhaut	W.	83 46 42	2967	85 17 36	2979	86 48 14	2992	88 18 37	3005
	α Pegasi	W.	66 56 4	3276	68 20 43	3279	69 45 19	3282	71 9 51	3287
	Sun	E.	79 19 17	3142	77 51 58	3157	76 24 58	3172	74 58 15	3186
9	Fomalhaut	W.	95 46 37	3066	97 15 28	3078	98 44 4	3090	100 12 25	3102
	α Pegasi	W.	78 11 5	3314	79 35 0	3321	80 58 47	3327	82 22 27	3335
	α Arietis	W.	34 33 29	3282	35 58 1	3265	37 22 53	3251	38 48 2	3240
	Sun	E.	67 48 46	3252	66 23 38	3264	64 58 44	3276	63 34 4	3287
10	α Pegasi	W.	89 18 37	3372	90 41 25	3381	92 4 3	3390	93 26 31	3398

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Antares	W.	76° 57′ 12″	2012	78° 50′ 27″	2019	80° 43′ 31″	2027	82° 36′ 23″	2035
	α Arietis	E.	71 50 58	2129	70 0 43	2139	68 10 44	2151	66 21 4	2165
	Aldebaran	E.	102 13 58	2001	100 20 25	2008	98 27 3	2016	96 33 53	2024
2	Antares	W.	91 57 5	2088	93 48 23	2101	95 39 21	2114	97 29 59	2127
	α Aquilæ	W.	51 44 58	3385	53 7 32	3334	54 31 4	3289	55 55 28	3252
	Jupiter	W.	34 1 21	2044	35 53 47	2055	37 45 55	2066	39 37 46	2078
	α Arietis	E.	57 18 9	2248	55 30 53	2268	53 44 7	2290	51 57 55	2313
	Aldebaran	E.	87 11 44	2077	85 20 9	2090	83 28 53	2104	81 37 58	2117
3	Antares	W.	106 37 44	2204	108 26 7	2221	110 14 4	2237	112 1 37	2253
	α Aquilæ	W.	63 6 45	3132	64 34 16	3120	66 2 1	3110	67 29 59	3104
	Jupiter	W.	48 51 56	2149	50 41 40	2164	52 31 1	2180	54 19 58	2196
	α Arietis	E.	43 16 20	2462	41 34 13	2500	39 53 2	2541	38 12 46	2583
	Aldebaran	E.	72 28 48	2192	70 40 8	2208	68 51 52	2225	67 4 1	2242
4	α Aquilæ	W.	74 50 44	3106	76 18 46	3112	77 46 41	3119	79 14 27	3129
	Jupiter	W.	63 18 30	2282	65 4 56	2299	66 50 57	2317	68 36 31	2335
	Aldebaran	E.	58 11 14	2331	56 26 0	2349	54 41 13	2368	52 56 53	2388
	Sun	E.	122 32 19	2635	120 54 11	2654	119 16 28	2673	117 39 11	2692
5	α Aquilæ	W.	86 29 55	3195	87 56 10	3211	89 22 6	3229	90 47 41	3247
	Jupiter	W.	77 17 56	2424	79 0 56	2442	80 43 30	2460	82 25 39	2478
	Fomalhaut	W.	52 34 4	2743	54 9 47	2748	55 45 21	2756	57 20 46	2765
	α Pegasi	W.	39 16 29	3637	40 34 21	3576	41 53 21	3524	43 13 19	3480
	Aldebaran	E.	44 22 4	2485	42 40 29	2504	40 59 22	2524	39 18 42	2544
	Sun	E.	109 39 10	2786	108 4 26	2807	106 30 8	2826	104 56 15	2845
6	α Aquilæ	W.	97 49 48	3354	99 12 57	3378	100 35 39	3403	101 57 52	3429
	Jupiter	W.	90 50 17	2565	92 30 0	2582	94 9 20	2598	95 48 18	2614
	Fomalhaut	W.	65 14 49	2817	66 48 55	2829	68 22 47	2841	69 56 23	2853
	α Pegasi	W.	50 3 28	3338	51 26 56	3322	52 50 42	3308	54 14 44	3298
	Aldebaran	E.	31 2 22	2648	29 24 32	2669	27 47 10	2692	26 10 20	2716
	Sun	E.	97 12 58	2940	95 41 30	2958	94 10 25	2976	92 39 43	2994
7	α Aquilæ	W.	108 41 21	3573	110 0 25	3606	111 18 53	3639	112 36 46	3674
	Jupiter	W.	103 57 40	2692	105 34 30	2707	107 11 1	2722	108 47 12	2736
	Fomalhaut	W.	77 40 23	2916	79 12 22	2928	80 44 5	2941	82 15 31	2954
	α Pegasi	W.	61 17 12	3273	62 41 55	3272	64 6 39	3273	65 31 22	3274
	Sun	E.	85 11 38	3080	83 43 4	3094	82 14 49	3110	80 46 53	3126
8	Jupiter	W.	116 43 35	2801	118 18 1	2813	119 52 10	2826	121 26 4	2838
	Fomalhaut	W.	89 48 44	3018	91 18 35	3030	92 48 11	3042	94 17 31	3054
	α Pegasi	W.	72 34 17	3291	73 58 39	3297	75 22 54	3302	76 47 3	3308
	Sun	E.	73 31 49	3200	72 5 40	3214	70 39 46	3227	69 14 9	3240
9	Fomalhaut	W.	101 40 32	3114	103 8 24	3126	104 36 2	3138	106 3 26	3149
	α Pegasi	W.	83 45 58	3342	85 9 21	3350	86 32 35	3357	87 55 41	3365
	α Arietis	W.	40 13 24	3230	41 38 59	3220	43 4 44	3213	44 30 38	3208
	Sun	E.	62 9 37	3298	60 45 23	3309	59 21 21	3319	57 57 32	3329
10	α Pegasi	W.	94 48 50	3408	96 10 58	3416	97 32 57	3425	98 54 45	3435

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
10	α Arietis	W.	45° 56′ 37″	3904	47° 22′ 41″	3901	48° 48′ 49″	3197	50° 15′ 2″	3195
	Sun	E.	56 33 54	3338	55 10 27	3347	53 47 11	3356	52 24 6	3365
11	α Pegasi	W.	100 16 22	3445	101 37 48	3454	102 59 4	3465	104 20 7	3475
	α Arietis	W.	57 26 30	3192	58 52 49	3191	60 19 9	3192	61 45 28	3191
	Aldebaran	W.	25 43 50	3078	27 12 27	3077	28 41 6	3076	30 9 44	3076
	Sun	E.	45 31 4	3406	44 8 54	3413	42 46 52	3420	41 24 59	3427
12	α Arietis	W.	68 56 59	3194	70 23 16	3194	71 49 32	3195	73 15 47	3195
	Aldebaran	W.	37 32 40	3083	39 1 10	3085	40 29 39	3086	41 58 7	3087
	Sun	E.	34 37 25	3461	33 16 17	3467	31 55 16	3473	30 34 22	3481
13	α Arietis	W.	80 26 53	3197	81 53 6	3197	83 19 17	3198	84 45 29	3198
	Aldebaran	W.	49 20 4	3091	50 48 25	3091	52 16 45	3091	53 45 5	3092
	Sun	E.	23 52 1	3526	22 32 6	3537	21 12 25	3549	19 52 59	3565
17	Sun	W.	20 33 40	3486	21 54 20	3469	23 15 19	3454	24 36 34	3442
	Spica	E.	38 28 22	3093	37 0 4	3094	35 31 47	3095	34 3 30	3097
	Antares	E.	84 13 31	3042	82 44 10	3038	81 14 44	3033	79 45 12	3028
18	Sun	W.	31 26 11	3386	32 48 43	3375	34 11 26	3366	35 34 20	3356
	Antares	E.	72 16 1	3002	70 45 51	2997	69 15 34	2991	67 45 10	2985
	α Aquilæ	E.	116 3 27	3920	114 50 28	3891	113 36 59	3864	112 23 3	3838
19	Sun	W.	42 31 37	3309	43 55 38	3299	45 19 51	3289	46 44 15	3279
	Antares	E.	60 11 13	2953	58 40 1	2946	57 8 40	2939	55 37 10	2932
	α Aquilæ	E.	106 7 4	3727	104 50 45	3708	103 34 6	3690	102 17 8	3672
	Jupiter	E.	116 1 29	2891	114 28 58	2882	112 56 16	2874	111 23 24	2866
20	Sun	W.	53 49 20	3225	55 15 0	3214	56 40 53	3202	58 7 0	3190
	Antares	E.	47 57 18	2894	46 24 51	2886	44 52 13	2878	43 19 25	2870
	α Aquilæ	E.	95 47 50	3596	94 29 11	3583	93 10 18	3570	91 51 11	3558
	Jupiter	E.	103 36 15	2820	102 2 14	2810	100 27 59	2800	98 53 32	2789
21	Sun	W.	65 21 14	3127	66 48 51	3114	68 16 45	3101	69 44 55	3086
	Venus	W.	22 6 13	3284	23 30 43	3259	24 55 43	3235	26 21 11	3212
	Antares	E.	35 32 56	2833	33 59 11	2826	32 25 17	2819	30 51 14	2815
	α Aquilæ	E.	85 12 37	3510	83 52 24	3502	82 32 2	3495	81 11 32	3488
	Jupiter	E.	90 57 42	2735	89 21 48	2722	87 45 37	2710	86 9 10	2698
22	Sun	W.	77 10 7	3012	78 40 5	2997	80 10 21	2982	81 40 57	2966
	Venus	W.	33 35 4	3108	35 3 4	3088	36 31 28	3069	38 0 16	3050
	Spica	W.	24 38 4	2811	26 12 17	2782	27 47 9	2753	29 22 38	2727
	α Aquilæ	E.	74 27 44	3473	73 6 50	3473	71 45 56	3474	70 25 3	3477
	Jupiter	E.	78 2 37	2632	76 24 25	2618	74 45 54	2603	73 7 3	2589
	Fomalhaut	E.	105 50 25	2849	104 17 2	2835	102 43 19	2821	101 9 16	2804
23	Sun	W.	89 19 1	2884	90 51 40	2867	92 24 41	2849	93 58 4	2832
	Venus	W.	45 30 7	2955	47 1 16	2936	48 32 48	2917	50 4 45	2898
	Spica	W.	37 28 11	2614	39 6 47	2593	40 45 52	2573	42 25 24	2553
	α Aquilæ	E.	63 42 5	3518	62 22 1	3534	61 2 14	3551	59 42 46	3571
	Jupiter	E.	64 47 52	2515	63 6 59	2499	61 25 45	2485	59 44 10	2469

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
10	α Arietis	W.	51° 41′ 17″	3193	53° 7′ 34″	3193	54° 33′ 52″	3192	56° 0′ 11″	3192
	Sun	E.	51 1 11	3374	49 38 25	3382	48 15 49	3390	46 53 22	3398
11	α Pegasi	W.	105 40 59	3486	107 1 38	3497	108 22 5	3509	109 42 18	3522
	α Arietis	W.	63 11 48	3192	64 38 7	3192	66 4 26	3193	67 30 43	3194
	Aldebaran	W.	31 38 23	3077	33 6 59	3079	34 35 34	3080	36 4 9	3082
	Sun	E.	40 3 13	3434	38 41 35	3441	37 20 5	3448	35 58 41	3455
12	α Arietis	W.	74 42 1	3196	76 8 15	3196	77 34 28	3196	79 0 41	3197
	Aldebaran	W.	43 26 33	3088	44 54 57	3089	46 23 21	3090	47 51 43	3091
	Sun	E.	29 13 37	3488	27 53 0	3495	26 32 30	3504	25 12 10	3514
13	α Arietis	W.	86 11 40	3198	87 37 51	3199	89 4 1	3199	90 30 12	3199
	Aldebaran	W.	55 13 25	3092	56 41 44	3092	58 10 4	3092	59 38 24	3092
	Sun	E.	18 33 50	3584	17 15 1	3606	15 56 36	3630	14 38 41	3655
17	Sun	W.	25 58 3	3430	27 19 46	3418	28 41 43	3408	30 3 51	3397
	Spica	E.	32 35 17	3100	31 7 7	3103	29 39 1	3108	28 11 1	3114
	Antares	E.	78 15 34	3023	76 45 50	3018	75 16 0	3013	73 46 3	3008
18	Sun	W.	36 57 25	3347	38 20 42	3337	39 44 9	3327	41 7 48	3318
	Antares	E.	66 14 38	2979	64 43 59	2973	63 13 12	2966	61 42 16	2960
	α Aquilæ	E.	111 8 40	3813	109 53 51	3790	108 38 38	3768	107 23 2	3746
19	Sun	W.	48 8 51	3269	49 33 39	3258	50 58 40	3247	52 23 53	3236
	Antares	E.	54 5 31	2924	52 33 42	2917	51 1 44	2910	49 29 36	2902
	α Aquilæ	E.	100 59 50	3655	99 42 15	3639	98 24 23	3624	97 6 14	3610
	Jupiter	E.	109 50 21	2857	108 17 7	2848	106 43 42	2839	105 10 5	2829
20	Sun	W.	59 33 21	3178	60 59 57	3166	62 26 47	3153	63 53 53	3140
	Antares	E.	41 46 27	2862	40 13 19	2854	38 40 1	2846	37 6 33	2839
	α Aquilæ	E.	90 31 51	3547	89 12 19	3537	87 52 36	3526	86 32 41	3518
	Jupiter	E.	97 18 50	2779	95 43 55	2769	94 8 46	2757	92 33 22	2745
21	Sun	W.	71 13 22	3073	72 42 6	3058	74 11 8	3042	75 40 29	3028
	Venus	W.	27 47 6	3189	29 13 28	3168	30 40 15	3147	32 7 28	3128
	Antares	E.	29 17 5	2812	27 42 53	2810	26 8 38	2809	24 34 20	2808
	α Aquilæ	E.	79 50 56	3484	78 30 14	3480	77 9 28	3476	75 48 37	3474
	Jupiter	E.	84 32 25	2685	82 55 25	2672	81 18 7	2658	79 40 31	2645
22	Sun	W.	83 11 53	2950	84 43 9	2934	86 14 45	2918	87 46 42	2901
	Venus	W.	39 29 28	3031	40 59 2	3012	42 29 0	2993	43 59 22	2974
	Spica	W.	30 58 40	2702	32 35 17	2679	34 12 25	2656	35 50 4	2635
	α Aquilæ	E.	69 4 14	3481	67 43 29	3488	66 22 52	3496	65 2 23	3506
	Jupiter	E.	71 27 53	2575	69 48 24	2559	68 8 33	2545	66 28 23	2530
	Fomalhaut	E.	99 34 53	2787	98 0 8	2770	96 25 1	2754	94 49 33	2738
23	Sun	W.	95 31 49	2815	97 5 57	2798	98 40 26	2781	100 15 19	2764
	Venus	W.	51 37 5	2880	53 9 49	2861	54 42 58	2842	56 16 31	2823
	Spica	W.	44 5 24	2534	45 45 50	2515	47 26 44	2496	49 8 4	2477
	α Aquilæ	E.	58 23 40	3596	57 5 1	3624	55 46 53	3656	54 29 19	3693
	Jupiter	E.	58 2 13	2453	56 19 53	2437	54 37 11	2421	52 54 6	2405

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
23	Fomalhaut	E.	93° 13′ 43″	2722	91° 37′ 32″	2706	90° 1′ 0″	2689	88° 24′ 6″	2674
24	Sun	W.	101 50 34	2747	103 26 12	2730	105 2 13	2713	106 38 37	2696
	Venus	W.	57 50 28	2805	59 24 49	2786	60 59 35	2767	62 34 45	2749
	Spica	W.	50 49 50	2458	52 32 3	2439	54 14 41	2421	55 57 45	2403
	Jupiter	E.	51 10 39	2390	49 26 50	2374	47 42 38	2358	45 58 3	2343
	α Aquilæ	E.	53 12 25	3735	51 56 15	3785	50 40 57	3839	49 26 35	3902
	Fomalhaut	E.	80 14 27	2599	78 35 31	2585	76 56 15	2573	75 16 43	2559
	α Pegasi	E.	98 8 35	2830	96 34 46	2811	95 0 33	2792	93 25 55	2775
25	Sun	W.	114 46 23	2609	116 25 5	2593	118 4 9	2577	119 43 35	2561
	Venus	W.	70 36 42	2658	72 14 18	2641	73 52 17	2624	75 30 40	2607
	Spica	W.	64 39 29	2317	66 25 4	2300	68 11 4	2283	69 57 29	2267
	Jupiter	E.	37 9 32	2266	35 22 42	2252	33 35 32	2237	31 48 0	2224
	Fomalhaut	E.	66 54 26	2500	65 13 13	2491	63 31 45	2482	61 50 6	2474
	α Pegasi	E.	85 27 12	2696	83 50 27	2684	82 13 25	2671	80 36 6	2660
26	Sun	W.	128 6 5	2488	129 47 35	2475	131 29 24	2463	133 11 31	2450
	Venus	W.	83 48 19	2525	85 28 57	2509	87 9 55	2496	88 51 14	2481
	Spica	W.	78 55 20	2191	80 44 1	2177	82 33 3	2164	84 22 26	2151
	Antares	W.	33 6 50	2231	34 54 31	2213	36 42 39	2194	38 31 16	2176
	Fomalhaut	E.	53 19 42	2455	51 37 26	2456	49 55 11	2460	48 13 1	2467
	α Pegasi	E.	72 26 18	2621	70 47 53	2618	69 9 23	2617	67 30 51	2616
27	Venus	W.	97 22 32	2419	99 5 39	2408	100 49 1	2399	102 32 37	2389
	Spica	W.	93 34 4	2092	95 25 15	2082	97 16 41	2073	99 8 22	2065
	Antares	W.	47 40 27	2103	49 31 22	2091	51 22 34	2080	53 14 4	2069
	Fomalhaut	E.	39 45 59	2553	38 5 59	2583	36 26 41	2624	34 48 18	2671
	α Pegasi	E.	59 19 3	2649	57 41 15	2663	56 3 46	2681	54 26 41	2703
	α Arietis	E.	100 29 13	2190	98 40 31	2179	96 51 32	2169	95 2 18	2159
28	Spica	W.	108 29 41	2033	110 22 24	2028	112 15 14	2025	114 8 9	2023
	Antares	W.	62 35 14	2029	64 28 3	2024	66 21 0	2018	68 14 6	2014
	α Arietis	E.	85 52 56	2125	84 2 35	2121	82 12 8	2118	80 21 36	2116
	Aldebaran	E.	116 38 19	2018	114 45 13	2013	112 51 59	2008	110 58 37	2005
29	Antares	W.	77 40 44	2007	79 34 8	2007	81 27 31	2009	83 20 52	2011
	α Aquilæ	W.	42 3 33	4125	43 13 11	3974	44 25 16	3842	45 39 35	3725
	Jupiter	W.	22 44 30	1986	24 38 26	1984	26 32 26	1984	28 26 26	1985
	α Arietis	E.	71 8 43	2122	69 18 17	2126	67 27 58	2132	65 37 48	2139
	Aldebaran	E.	101 30 47	1998	99 37 9	1998	97 43 32	2000	95 49 58	2003
30	Antares	W.	92 46 11	2036	94 38 49	2043	96 31 16	2051	98 23 31	2060
	α Aquilæ	W.	52 17 56	3318	53 41 47	3262	55 6 43	3214	56 32 36	3172
	Jupiter	W.	37 55 45	2001	39 49 17	2008	41 42 39	2015	43 35 50	2023
	α Arietis	E.	56 30 17	2194	54 41 42	2210	52 53 30	2228	51 5 45	2247
	Aldebaran	E.	86 23 34	2028	84 30 43	2035	82 38 4	2042	80 45 36	2052
31	α Aquilæ	W.	63 52 34	3035	65 22 3	3021	66 51 50	3009	68 21 52	2999
	Jupiter	W.	52 58 17	2074	54 49 56	2086	56 41 17	2098	58 32 19	2112
	α Arietis	E.	42 15 6	2378	40 31 0	2414	38 47 45	2452	37 5 24	2496
	Aldebaran	E.	71 27 5	2105	69 36 14	2118	67 45 45	2132	65 55 35	2147

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P.L. of Diff.	XVh.	P.L. of Diff.	XVIIIh.	P.L. of Diff.	XXIh.	P.L. of Diff
23	Fomalhaut	E.	86° 46′ 51″	2659	85° 9′ 16″	2643	83° 31′ 20″	2628	81° 53′ 3″	2614
24	Sun	W.	108 15 25	2678	109 52 35	2660	111 30 8	2643	113 8 4	2626
	Venus	W.	64 10 20	2731	65 46 19	2712	67 22 43	2694	68 59 30	2676
	Spica	W.	57 41 15	2385	59 25 11	2368	61 9 32	2351	62 54 18	2334
	Jupiter	E.	44 13 6	2327	42 27 46	2311	40 42 3	2296	38 55 58	2282
	α Aquilæ	E.	48 13 17	3973	47 1 11	4054	45 50 25	4147	44 41 8	4254
	Fomalhaut	E.	73 36 48	2545	71 56 37	2533	70 16 9	2521	68 35 25	2510
	α Pegasi	E.	91 50 54	2757	90 15 30	2741	88 39 44	2725	87 3 38	2710
25	Sun	W.	121 23 23	2546	123 3 32	2531	124 44 2	2516	126 24 54	2502
	Venus	W.	77 9 27	2590	78 48 36	2572	80 28 8	2556	82 8 3	2539
	Spica	W.	71 44 17	2251	73 31 28	2236	75 19 3	2221	77 7 0	2206
	Jupiter	E.	30 0 8	2211	28 11 57	2199	26 23 28	2188	24 34 41	2179
	Fomalhaut	E.	60 8 16	2467	58 26 16	2462	56 44 10	2458	55 1 57	2456
	α Pegasi	E.	78 58 33	2650	77 20 46	2641	75 42 47	2633	74 4 37	2626
26	Sun	W.	134 53 56	2438	136 36 37	2428	138 19 32	2417	140 2 43	2408
	Venus	W.	90 32 53	2468	92 14 51	2454	93 57 7	2443	95 39 41	2430
	Spica	W.	86 12 9	2138	88 2 10	2125	89 52 31	2114	91 43 9	2103
	Antares	W.	40 20 19	2160	42 9 47	2144	43 59 39	2130	45 49 53	2116
	Fomalhaut	E.	46 31 1	2476	44 49 14	2488	43 7 45	2504	41 26 37	2525
	α Pegasi	E.	65 52 18	2618	64 13 48	2622	62 35 23	2629	60 57 7	2638
27	Venus	W.	104 16 27	2381	106 0 29	2373	107 44 43	2366	109 29 7	2359
	Spica	W.	101 0 15	2057	102 52 21	2050	104 44 38	2043	106 37 5	2037
	Antares	W.	55 5 51	2060	56 57 52	2052	58 50 6	2042	60 42 35	2035
	Fomalhaut	E.	33 10 59	2732	31 35 1	2802	30 0 36	2892	28 28 7	2999
	α Pegasi	E.	52 50 5	2729	51 14 4	2760	49 38 43	2795	48 4 8	2836
	α Arietis	E.	93 12 49	2151	91 23 7	2143	89 33 14	2136	87 43 9	2130
28	Spica	W.	116 1 7	2021	117 54 9	2021	119 47 11	2020	121 40 14	2021
	Antares	W.	70 7 18	2010	72 0 35	2009	73 53 56	2007	75 47 19	2006
	α Arietis	E.	78 31 1	2115	76 40 25	2115	74 49 48	2116	72 59 14	2118
	Aldebaran	E.	109 5 10	2001	107 11 38	2000	105 18 3	1998	103 24 25	1998
29	Antares	W.	85 14 9	2015	87 7 20	2019	89 0 24	2023	90 53 23	2030
	α Aquilæ	W.	46 55 56	3623	48 14 6	3531	49 33 56	3451	50 55 15	3379
	Jupiter	W.	30 20 25	1986	32 14 22	1988	34 8 16	1991	36 2 4	1996
	α Arietis	E.	63 47 48	2148	61 58 2	2157	60 8 30	2169	58 19 15	2180
	Aldebaran	E.	93 56 28	2007	92 3 4	2010	90 9 46	2015	88 16 35	2021
30	Antares	W.	100 15 32	2070	102 7 18	2079	103 58 49	2091	105 50 2	2102
	α Aquilæ	W.	57 59 19	3136	59 26 45	3104	60 54 50	3077	62 23 28	3054
	Jupiter	W.	45 28 49	2032	47 21 34	2041	49 14 4	2051	51 6 19	2062
	α Arietis	E.	49 18 27	2269	47 31 42	2292	45 45 31	2318	43 59 58	2346
	Aldebaran	E.	78 53 22	2062	77 1 24	2071	75 9 40	2083	73 18 14	2094
31	α Aquilæ	W.	69 52 6	2993	71 22 27	2990	72 52 52	2989	74 23 19	2990
	Jupiter	W.	60 23 0	2126	62 13 19	2140	64 3 17	2155	65 52 53	2171
	α Arietis	E.	35 24 5	2546	33 43 56	2602	32 5 1	2661	30 27 23	2723
	Aldebaran	E.	64 5 46	2161	62 16 19	2176	60 27 16	2191	58 38 35	2208

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Mon.	1	10 42 15.05	9.066	N. 8 12 54.8	-54.50	15 53.73	64.40	0 9.08	0.788
Tues.	2	10 45 52.49	9.055	7 51 2.9	54.83	15 53.96	64.36	0 28.15	0.799
Wed.	3	10 49 29.66	9.044	7 29 3.4	55.14	15 54.19	64.32	0 47.48	0.810
Thur.	4	10 53 6.59	9.034	7 6 56.5	-55.43	15 54.42	64.28	1 7.06	0.820
Frid.	5	10 56 43.29	9.025	6 44 42.6	55.72	15 54.66	64.25	1 26.86	0.829
Sat.	6	11 0 19.78	9.017	6 22 22.0	56.01	15 54.89	64.22	1 46.86	0.837
SUN.	7	11 3 56.09	9.009	5 59 54.9	-56.26	15 55.13	64.19	2 7.04	0.845
Mon.	8	11 7 32.23	9.002	5 37 21.7	56.51	15 55.37	64.16	2 27.40	0.852
Tues.	9	11 11 8.22	8.996	5 14 42.8	56.74	15 55.61	64.14	2 47.91	0.858
Wed.	10	11 14 44.07	8.991	4 51 58.3	-56.96	15 55.86	64.12	3 8.56	0.863
Thur.	11	11 18 19.80	8.986	4 29 8.9	57.15	15 56.11	64.10	3 29.33	0.868
Frid.	12	11 21 55.43	8.982	4 6 14.6	57.34	15 56.36	64.08	3 50.20	0.872
Sat.	13	11 25 30.97	8.979	3 43 16.0	-57.52	15 56.61	64.07	4 11.15	0.875
SUN.	14	11 29 6.44	8.977	3 20 13.2	57.69	15 56.87	64.06	4 32.17	0.877
Mon.	15	11 32 41.86	8.975	2 57 6.7	57.84	15 57.13	64.05	4 53.25	0.879
Tues.	16	11 36 17.24	8.974	2 33 56.8	-57.97	15 57.39	64.05	5 14.37	0.880
Wed.	17	11 39 52.59	8.973	2 10 44.0	58.08	15 57.66	64.05	5 35.51	0.881
Thur.	18	11 43 27.94	8.974	1 47 28.5	58.18	15 57.93	64.05	5 56.65	0.880
Frid.	19	11 47 3.32	8 975	1 24 10.8	-58.27	15 58.20	64.06	6 17.77	0.879
Sat.	20	11 50 38.73	8.976	1 0 51.1	58.34	15 58.47	64.07	6 38.86	0.877
SUN.	21	11 54 14.18	8.979	0 37 29.9	58.40	15 58.74	64.08	6 59.90	0.875
Mon.	22	11 57 49.70	8.982	N. 0 14 7.4	-58.45	15 59.01	64.10	7 20.88	0.872
Tues.	23	12 1 25.31	8.986	S. 0 9 15.8	58.48	15 59.29	64.12	7 41.76	0.868
Wed.	24	12 5 1.04	8 992	0 32 39.7	58.50	15 59.56	64.14	8 2.53	0.862
Thur.	25	12 8 36.91	8.998	0 56 3.7	-58.50	15 59.84	64.16	8 23.16	0.856
Frid.	26	12 12 12 94	9.005	1 19 27.6	58.49	16 0.11	64.18	8 43.63	0.849
Sat.	27	12 15 49.15	9.013	1 42 51.0	58.46	16 0.39	64.21	9 3 92	0.841
SUN.	28	12 19 25.56	9.022	2 6 13.7	-58.42	16 0.66	64.24	9 24.01	0.832
Mon.	29	12 23 2.20	9 032	2 29 35.3	58.36	16 0.94	64.28	9 43.85	0.822
Tues.	30	12 26 39.10	9.044	2 52 55.4	58.29	16 1.21	64.32	10 3.46	0.810
Wed.	31	12 30 16 28	9.056	S. 3 16 13.7	-58.22	16 1.49	64.36	10 22.79	0.798

NOTE.—The mean time of semidiameter passing may be found by subtracting 0s.18 from the sidereal time.
The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing; south declinations, increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Mon.	1	10 42 15.07	9.068	N. 8 12 54.7	-54.51	0 9.08	0.788	10 42 21.16
Tues.	2	10 45 52.56	9.057	7 51 2.5	54.84	0 28.15	0.799	10 46 20.71
Wed.	3	10 49 29.78	9.046	7 29 2.7	55.15	0 47.49	0.810	10 50 17.27
Thur.	4	10 53 6.76	9.036	7 6 55.5	-55.44	1 7.07	0.820	10 54 13.82
Frid.	5	10 56 43.51	9.027	6 44 41.3	55.73	1 26.87	0.829	10 58 10.38
Sat.	6	11 0 20.05	9.019	6 22 20.4	56.01	1 46.88	0.837	11 2 6.93
SUN.	7	11 3 56.41	9.011	5 59 53.0	-56.27	2 7.07	0.845	11 6 3.48
Mon.	8	11 7 32.60	9.004	5 37 19.5	56.52	2 27.43	0.852	11 10 0.03
Tues.	9	11 11 8.64	8.998	5 14 40.2	56.75	2 47.95	0.858	11 13 56.59
Wed.	10	11 14 44.54	8.993	4 51 55.4	-56.97	3 8.60	0.863	11 17 53.14
Thur.	11	11 18 20.32	8.988	4 29 5.6	57.17	3 29.38	0.868	11 21 49.70
Frid.	12	11 21 56.00	8.984	4 6 11.0	57.36	3 50.25	0.872	11 25 46.25
Sat.	13	11 25 31.59	8.981	3 43 12.0	-57.54	4 11.21	0.875	11 29 42.80
SUN.	14	11 29 7.12	8.979	3 20 8.9	57.71	4 32.23	0.877	11 33 39.35
Mon.	15	11 32 42.59	8.977	2 57 2.0	57.86	4 53.32	0.879	11 37 35.91
Tues.	16	11 36 18.02	8.976	2 33 51.8	-57.99	5 14.44	0.880	11 41 32.46
Wed.	17	11 39 53.43	8.975	2 10 38.6	58.10	5 35.59	0.881	11 45 29.02
Thur.	18	11 43 28.83	8.976	1 47 22.8	58.20	5 56.74	0.880	11 49 25.57
Frid.	19	11 47 4.26	8.977	1 24 4.7	-58.29	6 17.86	0.879	11 53 22.12
Sat.	20	11 50 39.72	8.979	1 0 44.7	58.36	6 38.95	0.877	11 57 18.67
SUN.	21	11 54 15.22	8.981	0 37 23.1	58.42	7 0.00	0.875	12 1 15.22
Mon.	22	11 57 50.79	8.984	N. 0 14 0.3	-58.47	7 20.98	0.872	12 5 11.77
Tues.	23	12 1 26.46	8.988	S. 0 9 23.3	58.50	7 41.87	0.868	12 9 8.33
Wed.	24	12 5 2.25	8.994	0 32 47.5	58.52	8 2.64	0.862	12 13 4.88
Thur.	25	12 8 38.17	9.000	0 56 11.9	-58.52	8 23.27	0.856	12 17 1.44
Frid.	26	12 12 14.24	9.007	1 19 36.1	58.51	8 43.75	0.849	12 20 57.99
Sat.	27	12 15 50.50	9.015	1 42 59.9	58.48	9 4.04	0.841	12 24 54.54
SUN.	28	12 19 26.97	9.024	2 6 22.9	-58.44	9 24.12	0.832	12 28 51.09
Mon.	29	12 23 3.67	9.034	2 29 44.8	58.38	9 43.98	0.822	12 32 47.65
Tues.	30	12 26 40.62	9.046	2 53 5.3	58.31	10 3.59	0.810	12 36 44.20
Wed.	31	12 30 17.85	9.058	S. 3 16 23.8	-58.23	10 22.91	0.798	12 40 40.76

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign − prefixed to the hourly change of declination indicates that north declinations are decreasing; south declinations, increasing.

Diff. for 1 Hour,
+9ˢ.8565.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ′	Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	244	158 57 56.3	57 38.8	145.24	− 0.64	0.0037483	−43.2	13 15 25.17
2	245	159 56 2.9	55 45.3	145.31	0.59	0.0036443	43.5	13 11 29.26
3	246	160 54 11.4	53 53.7	145.39	0.52	0.0035396	43.8	13 7 33.36
4	247	161 52 21.8	52 4.0	145.47	− 0.42	0.0034342	−44.1	13 3 37.45
5	248	162 50 34.3	50 16.4	145.56	0.30	0.0033280	44.5	12 59 41.54
6	249	163 48 48.8	48 30.8	145.64	0.17	0.0032209	44.8	12 55 45.63
7	250	164 47 5.3	46 47.2	145.73	− 0.04	0.0031129	−45.2	12 51 49.72
8	251	165 45 23.8	45 5.6	145.81	+ 0.09	0.0030039	45.6	12 47 53.82
9	252	166 43 44.4	43 26.1	145.90	0.20	0.0028938	46.1	12 43 57.91
10	253	167 42 7.1	41 48.7	145.99	+ 0.30	0.0027825	−46.6	12 40 2.00
11	254	168 40 31.9	40 13.4	146.07	0.37	0.0026698	47.2	12 36 6.10
12	255	169 38 58.7	38 40.1	146.15	0.42	0.0025557	47.8	12 32 10.20
13	256	170 37 27.4	37 8.7	146.24	+ 0.45	0.0024403	−48.4	12 28 14.29
14	257	171 35 58.1	35 39.3	146.32	0.44	0.0023235	49.0	12 24 18.38
15	258	172 34 30.7	34 11.8	146.40	0.40	0.0022054	49.5	12 20 22.47
16	259	173 33 5.1	32 46.1	146.48	+ 0.33	0.0020859	−50.0	12 16 26.56
17	260	174 31 41.3	31 22.2	146.55	0.24	0.0019652	50.5	12 12 30.65
18	261	175 30 19.2	30 0.0	146.62	+ 0.13	0.0018435	50.9	12 8 34.74
19	262	176 28 58.9	28 39.6	146.69	0.00	0.0017208	−51.3	12 4 38.84
20	263	177 27 40.3	27 20.9	146.76	− 0.13	0.0015973	51.7	12 0 42.93
21	264	178 26 23.3	26 3.8	146.83	0.27	0.0014731	51.8	11 56 47.02
22	265	179 25 8.0	24 48.4	146.90	− 0.40	0.0013484	−52.0	11 52 51.11
23	266	180 23 54.4	23 34.7	146.96	0.51	0.0012233	52.2	11 48 55.21
24	267	181 22 42.6	22 22.8	147.04	0.60	0.0010980	52.2	11 44 59.31
25	268	182 21 32.5	21 12.6	147.11	− 0.68	0.0009728	−52.2	11 41 3.40
26	269	183 20 24.2	20 4.2	147.19	0.73	0.0008477	52.1	11 37 7.49
27	270	184 19 17.8	18 57.7	147.27	0.74	0.0007228	52.0	11 33 11.58
28	271	185 18 13.3	17 53.1	147.36	− 0.72	0.0005982	−51.9	11 29 15.68
29	272	186 17 10.7	16 50.4	147.44	0.68	0.0004739	51.7	11 25 19.77
30	273	187 16 10.2	15 49.8	147.52	0.60	0.0003499	51.6	11 21 23.86
31	274	188 15 11.8	14 51.3	147.61	− 0.50	0.0002264	−51.4	11 17 27.96

Note.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January 0ᵈ.0.

Diff. for 1 Hour, — 9ˢ.8296. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 19.5	16 12.4	59 48.0	−2.08	59 22.0	−2.24	14 35.3	2.07	16.8
2	16 4.9	15 57.1	58 54.4	2.35	58 25.8	2.40	15 24.4	2.04	17.8
3	15 49.2	15 41.5	57 56.9	2.40	57 28.4	2.35	16 13.3	2.05	18.8
4	15 33.9	15 26.7	57 0.7	−2.26	56 34.2	−2.15	17 2.7	2.07	19.8
5	15 19.9	15 13.7	56 9.3	2.00	55 46.4	1.84	17 52.7	2.09	20.8
6	15 8.0	15 2.9	55 25.5	1.65	55 6.9	1.45	18 43.3	2.11	21.8
7	14 58.5	14 54.7	54 50.7	−1.26	54 36.8	−1.07	19 33.9	2.10	22.8
8	14 51.6	14 49.1	54 25.2	0.87	54 16.0	0.68	20 24.0	2.06	23.8
9	14 47.2	14 45.8	54 9.0	0.50	54 4.2	−0.32	21 12.7	2.00	24.8
10	14 45.1	14 44.9	54 1.5	−0.15	54 0.7	+0.01	21 59.8	1.92	25.8
11	14 45.2	14 45.9	54 1.7	+0.16	54 4.3	0.29	22 44.9	1.84	26.8
12	14 47.0	14 48.6	54 8.5	0.41	54 14.1	0.52	23 28.4	1.79	27.8
13	14 50.4	14 52.6	54 20.9	+0.63	54 29.0	+0.72	ó		28.8
14	14 55.1	14 57.8	54 38.1	0.80	54 48.2	0.88	0 10.8	1.75	0.2
15	15 0.8	15 4.1	54 59.2	0.96	55 11.1	1.04	0 52.6	1.75	1.2
16	15 7.6	15 11.3	55 23.9	+1.10	55 37.6	+1.17	1 34.9	1.79	2.2
17	15 15.2	15 19.4	55 52.0	1.24	56 7.3	1.31	2 18.4	1.86	3.2
18	15 23.7	15 28.3	56 23.3	1.38	56 40.2	1.44	3 4.0	1.98	4.2
19	15 33.1	15 38.1	56 57.8	+1.50	57 16.2	+1.56	3 52.8	2.11	5.2
20	15 43.3	15 48.6	57 35.2	1.61	57 54.7	1.64	4 45.4	2.26	6.2
21	15 54.0	15 59.4	58 14.5	1.66	58 34.4	1.65	5 41.7	2.41	7.2
22	16 4.8	16 10.0	58 54.1	+1.63	59 13.3	+1.56	6 41.2	2.51	8.2
23	16 15.0	16 19.6	59 31.5	1.47	59 48.4	1.34	7 42.2	2.53	9.2
24	16 23.7	16 27.1	60 3.4	1.16	60 16.1	0.95	8 42.8	2.48	10.2
25	16 29.8	16 31.7	60 26.1	+0.70	60 32.8	+0.41	9 41.3	2.38	11.2
26	16 32.5	16 32.3	60 36.0	+0.11	60 35.3	−0.22	10 37.1	2.27	12.2
27	16 31.1	16 28.8	60 30.7	−0.55	60 22.2	0.87	11 30.2	2.17	13.2
28	16 25.4	16 21.1	60 9.9	−1.18	59 54.0	−1.46	12 21.4	2.11	14.2
29	16 15.9	16 10.0	59 35.0	1.70	59 13.3	1.90	13 11.6	2.09	15.2
30	16 3.5	15 56.6	58 49.4	2.05	58 24.1	2.15	14 1.6	2.09	16.2
31	15 49.5	15 42.2	57 57.8	−2.20	57 31.3	−2.21	14 52.0	2.12	17.2

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	0 48 26.68	2.1895	N. 0 6 18.3	15.156
1	0 50 37.97	2.1869	0 21 27.1	15.137
2	0 52 49.11	2.1845	0 36 34.7	15.116
3	0 55 0.11	2.1821	0 51 41.0	15.093
4	0 57 10.96	2.1796	1 6 45.9	15.069
5	0 59 21.66	2.1772	1 21 49.3	15.043
6	1 1 32.22	2.1749	1 36 51.1	15.017
7	1 3 42.64	2.1727	1 51 51.3	14.989
8	1 5 52.94	2.1706	2 6 49.8	14.959
9	1 8 3.11	2.1684	2 21 46.4	14.928
10	1 10 13.15	2.1663	2 36 41.1	14.895
11	1 12 23.07	2.1644	2 51 33.8	14.861
12	1 14 32.88	2.1625	3 6 24.4	14.826
13	1 16 42.57	2.1607	3 21 12.9	14.789
14	1 18 52.16	2.1589	3 35 59.1	14.751
15	1 21 1.64	2.1572	3 50 43.0	14.712
16	1 23 11.02	2.1555	4 5 24.6	14.671
17	1 25 20.30	2.1539	4 20 3.6	14.628
18	1 27 29.49	2.1524	4 34 40.0	14.585
19	1 29 38.59	2.1509	4 49 13.8	14.542
20	1 31 47.60	2.1495	5 3 45.0	14.497
21	1 33 56.53	2.1482	5 18 13.4	14.449
22	1 36 5.38	2.1469	5 32 38.9	14.401
23	1 38 14.16	2.1457	N. 5 47 1.5	14.352

TUESDAY 2.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	1 40 22.87	2.1446	N. 6 1 21.1	14.301
1	1 42 31.51	2.1434	6 15 37.6	14.249
2	1 44 40.08	2.1423	6 29 51.0	14.197
3	1 46 48.59	2.1413	6 44 1.2	14.143
4	1 48 57.04	2.1404	6 58 8.1	14.087
5	1 51 5.44	2.1396	7 12 11.6	14.030
6	1 53 13.79	2.1388	7 26 11.7	13.972
7	1 55 22.09	2.1380	7 40 8.3	13.914
8	1 57 30.35	2.1372	7 54 1.4	13.855
9	1 59 38.56	2.1366	8 7 50.9	13.794
10	2 1 46.74	2.1360	8 21 36.7	13.732
11	2 3 54.88	2.1354	8 35 18.7	13.669
12	2 6 2.99	2.1349	8 48 56.9	13.605
13	2 8 11.07	2.1345	9 2 31.3	13.540
14	2 10 19.13	2.1342	9 16 1.7	13.473
15	2 12 27.17	2.1338	9 29 28.1	13.406
16	2 14 35.19	2.1335	9 42 50.4	13.338
17	2 16 43.19	2.1332	9 56 8.6	13.269
18	2 18 51.18	2.1331	10 9 22.7	13.200
19	2 20 59.16	2.1330	10 22 32.6	13.129
20	2 23 7.14	2.1329	10 35 38.2	13.057
21	2 25 15.11	2.1328	10 48 39.4	12.983
22	2 27 23.08	2.1328	11 1 36.2	12.909
23	2 29 31.05	2.1328	11 14 28.5	12.834
24	2 31 39.02	2.1329	N.11 27 16.3	12.758

WEDNESDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	2 31 39.02	2.1329	N.11 27 16.3	12.758
1	2 33 47.00	2.1331	11 39 59.5	12.682
2	2 35 54.99	2.1333	11 52 38.1	12.604
3	2 38 2.99	2.1335	12 5 12.0	12.526
4	2 40 11.01	2.1338	12 17 41.2	12.447
5	2 42 19.05	2.1341	12 30 5.6	12.367
6	2 44 27.10	2.1344	12 42 25.2	12.286
7	2 46 35.18	2.1348	12 54 39.9	12.204
8	2 48 43.28	2.1352	13 6 49.7	12.121
9	2 50 51.41	2.1357	13 18 54.4	12.037
10	2 52 59.56	2.1361	13 30 54.1	11.952
11	2 55 7.74	2.1366	13 42 48.7	11.867
12	2 57 15.96	2.1372	13 54 38.2	11.782
13	2 59 24.21	2.1378	14 6 22.5	11.695
14	3 1 32.50	2.1385	14 18 1.6	11.607
15	3 3 40.83	2.1392	14 29 35.4	11.519
16	3 5 49.20	2.1398	14 41 3.9	11.431
17	3 7 57.61	2.1406	14 52 27.1	11.341
18	3 10 6.07	2.1414	15 3 44.8	11.250
19	3 12 14.58	2.1422	15 14 57.1	11.159
20	3 14 23.13	2.1429	15 26 3.9	11.066
21	3 16 31.73	2.1437	15 37 5.1	10.973
22	3 18 40.38	2.1446	15 48 0.7	10.880
23	3 20 49.08	2.1455	N.15 58 50.7	10.787

THURSDAY 4.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	3 22 57.84	2.1464	N.16 9 35.1	10.693
1	3 25 6.65	2.1473	16 20 13.8	10.597
2	3 27 15.52	2.1483	16 30 46.7	10.500
3	3 29 24.45	2.1493	16 41 13.8	10.403
4	3 31 33.44	2.1503	16 51 35.1	10.306
5	3 33 42.49	2.1512	17 1 50.5	10.208
6	3 35 51.59	2.1522	17 12 0.0	10.109
7	3 38 0.75	2.1533	17 22 3.6	10.010
8	3 40 9.98	2.1544	17 32 1.2	9.909
9	3 42 19.28	2.1555	17 41 52.7	9.808
10	3 44 28.64	2.1566	17 51 38.2	9.707
11	3 46 38.07	2.1577	18 1 17.6	9.606
12	3 48 47.56	2.1588	18 10 50.9	9.503
13	3 50 57.12	2.1599	18 20 18.0	9.400
14	3 53 6.75	2.1610	18 29 38.9	9.297
15	3 55 16.44	2.1621	18 38 53.6	9.193
16	3 57 26.20	2.1632	18 48 2.1	9.089
17	3 59 36.03	2.1644	18 57 4.3	8.984
18	4 1 45.93	2.1656	19 6 0.2	8.678
19	4 3 55.90	2.1667	19 14 49.7	8.772
20	4 6 5.94	2.1679	19 23 32.8	8.665
21	4 8 16.05	2.1691	19 32 9.5	8.557
22	4 10 26.23	2.1702	19 40 39.7	8.449
23	4 12 36.48	2.1713	19 49 3.4	8.341
24	4 14 46.79	2.1725	N.19 57 20.6	8.232

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 5.					**SUNDAY 7.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	4 14 46.79	2.1725	N.19 57 20.6	8.232	0	6 0 7.13	2.2065	N.24 20 6.8	2.614
1	4 16 57.18	2.1737	20 5 31.3	8.123	1	6 2 19.52	2.2064	24 22 40.0	2.492
2	4 19 7.64	2.1748	20 13 35.4	8.013	2	6 4 31.90	2.2063	24 25 5.9	2.371
3	4 21 18.16	2.1759	20 21 32.9	7.903	3	6 6 44.27	2.2061	24 27 24.5	2.249
4	4 23 28.75	2.1771	20 29 23.8	7.793	4	6 8 56.63	2.2058	24 29 35.8	2.127
5	4 25 39.41	2.1782	20 37 8.1	7.683	5	6 11 8.97	2.2056	24 31 39.8	2.005
6	4 27 50.14	2.1794	20 44 45.7	7.571	6	6 13 21.30	2.2053	24 33 36.4	1.883
7	4 30 0.94	2.1805	20 52 16.6	7.456	7	6 15 33.61	2.2049	24 35 25.7	1.762
8	4 32 11.80	2.1816	20 59 40.7	7.346	8	6 17 45.89	2.2045	24 37 7.8	1.641
9	4 34 22.73	2.1827	21 6 58.1	7.233	9	6 19 58.15	2.2041	24 38 42.6	1.519
10	4 36 33.73	2.1838	21 14 8.7	7.120	10	6 22 10.38	2.2036	24 40 10.0	1.397
11	4 38 44.79	2.1848	21 21 12.5	7.007	11	6 24 22.58	2.2030	24 41 30.2	1.276
12	4 40 55.91	2.1859	21 28 9.6	6.894	12	6 26 34.74	2.2024	24 42 43.1	1.154
13	4 43 7.10	2.1870	21 34 59.8	6.779	13	6 28 46.87	2.2018	24 43 48.7	1.033
14	4 45 18.35	2.1880	21 41 43.1	6.664	14	6 30 58.96	2.2011	24 44 47.0	0.912
15	4 47 29.66	2.1890	21 48 19.5	6.549	15	6 33 11.00	2.2004	24 45 38.1	0.791
16	4 49 41.03	2.1900	21 54 49.0	6.434	16	6 35 23.00	2.1996	24 46 21.9	0.669
17	4 51 52.46	2.1909	22 1 11.6	6.318	17	6 37 34.95	2.1987	24 46 58.4	0.548
18	4 54 3.94	2.1918	22 7 27.2	6.202	18	6 39 46.84	2.1978	24 47 27.7	0.428
19	4 56 15.48	2.1928	22 13 35.9	6.086	19	6 41 58.68	2.1969	24 47 49.7	0.307
20	4 58 27.08	2.1937	22 19 37.6	5.969	20	6 44 10.47	2.1960	24 48 4.5	0.187
21	5 0 38.73	2.1946	22 25 32.2	5.852	21	6 46 22.20	2.1949	24 48 12.1	+ 0.067
22	5 2 50.43	2.1954	22 31 19.8	5.735	22	6 48 33.86	2.1938	24 48 12.5	− 0.054
23	5 5 2.18	2.1963	N.22 37 0.4	5.617	23	6 50 45.46	2.1927	N.24 48 5.6	0.175
	SATURDAY 6.					**MONDAY 8.**			
0	5 7 13.99	2.1971	N.22 42 33.9	5.499	0	6 52 56.99	2.1916	N.24 47 51.5	0.295
1	5 9 25.84	2.1979	22 48 0.3	5.382	1	6 55 8.45	2.1903	24 47 30.2	0.414
2	5 11 37.74	2.1986	22 53 19.7	5.264	2	6 57 19.83	2.1891	24 47 1.8	0.533
3	5 13 49.68	2.1993	22 58 32.0	5.145	3	6 59 31.14	2.1878	24 46 26.2	0.652
4	5 16 1.66	2.2000	23 3 37.1	5.026	4	7 1 42.37	2.1865	24 45 43.5	0.771
5	5 18 13.68	2.2007	23 8 35.1	4.907	5	7 3 53.52	2.1852	24 44 53.7	0.890
6	5 20 25.75	2.2014	23 13 26.0	4.788	6	7 6 4.59	2.1838	24 43 56.7	1.009
7	5 22 37.85	2.2019	23 18 9.7	4.668	7	7 8 15.57	2.1823	24 42 52.6	1.127
8	5 24 49.98	2.2025	23 22 46.2	4.549	8	7 10 26.46	2.1807	24 41 41.4	1.245
9	5 27 2.15	2.2031	23 27 15.6	4.430	9	7 12 37.25	2.1791	24 40 23.2	1.362
10	5 29 14.35	2.2036	23 31 37.8	4.309	10	7 14 47.95	2.1775	24 38 57.9	1.480
11	5 31 26.58	2.2040	23 35 52.7	4.188	11	7 16 58.55	2.1758	24 37 25.6	1.598
12	5 33 38.83	2.2044	23 40 0.4	4.068	12	7 19 9.04	2.1740	24 35 46.2	1.715
13	5 35 51.11	2.2048	23 44 0.9	3.947	13	7 21 19.43	2.1723	24 33 59.8	1.831
14	5 38 3.41	2.2052	23 47 54.1	3.827	14	7 23 29.72	2.1706	24 32 6.5	1.947
15	5 40 15.73	2.2055	23 51 40.1	3.706	15	7 25 39.90	2.1688	24 30 6.2	2.063
16	5 42 28.07	2.2057	23 55 18.8	3.585	16	7 27 49.97	2.1669	24 27 58.9	2.179
17	5 44 40.42	2.2060	23 58 50.3	3.464	17	7 29 59.93	2.1650	24 25 44.7	2.294
18	5 46 52.79	2.2062	24 2 14.5	3.342	18	7 32 9.77	2.1630	24 23 23.6	2.409
19	5 49 5.17	2.2064	24 5 31.4	3.221	19	7 34 19.49	2.1610	24 20 55.6	2.524
20	5 51 17.56	2.2065	24 8 41.0	3.100	20	7 36 29.09	2.1590	24 18 20.7	2.638
21	5 53 29.95	2.2066	24 11 43.4	2.979	21	7 38 38.57	2.1569	24 15 39.0	2.752
22	5 55 42.35	2.2066	24 14 38.5	2.857	22	7 40 47.92	2.1548	24 12 50.5	2.865
23	5 57 54.74	2.2065	24 17 26.3	2.736	23	7 42 57.15	2.1527	24 9 55.2	2.978
24	6 0 7.13	2.2065	N.24 20 6.8	2.614	24	7 45 6.25	2.1505	N.24 6 53.1	3.091

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 9.					**THURSDAY 11.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	7 45 6.25	2.1505	N.24 6 53.1	3.091	0	9 25 18.36	2.0183	N.19 37 52.2	7.905
1	7 47 15.21	2.1483	24 3 44.3	3.203	1	9 27 19.37	2.0153	19 29 55.3	7.991
2	7 49 24.04	2.1461	24 0 28.8	3.315	2	9 29 20.20	2.0124	19 21 53.3	8.076
3	7 51 32.74	2.1438	23 57 6.5	3.427	3	9 31 20.86	2.0095	19 13 46.2	8.160
4	7 53 41.30	2.1414	23 53 37.6	3.538	4	9 33 21.34	2.0065	19 5 34.1	8.244
5	7 55 49.71	2.1390	23 50 2.0	3.648	5	9 35 21.64	2.0036	18 57 16.9	8.328
6	7 57 57.98	2.1366	23 46 19.8	3.758	6	9 37 21.77	2.0007	18 48 54.7	8.411
7	8 0 6.11	2.1342	23 42 31.0	3.868	7	9 39 21.72	1.9977	18 40 27.6	8.492
8	8 2 14.09	2.1318	23 38 35.6	3.977	8	9 41 21.50	1.9948	18 31 55.7	8.573
9	8 4 21.93	2.1294	23 34 33.7	4.086	9	9 43 21.10	1.9919	18 23 18.9	8.653
10	8 6 29.62	2.1269	23 30 25.3	4.194	10	9 45 20.53	1.9891	18 14 37.3	8.732
11	8 8 37.15	2.1243	23 26 10.4	4.302	11	9 47 19.79	1.9862	18 5 51.0	8.812
12	8 10 44.53	2.1218	23 21 49.0	4.410	12	9 49 18.87	1.9833	17 56 59.9	8.891
13	8 12 51.76	2.1192	23 17 21.2	4.517	13	9 51 17.78	1.9804	17 48 4.1	8.968
14	8 14 58.83	2.1165	23 12 47.0	4.623	14	9 53 16.52	1.9777	17 39 3.7	9.045
15	8 17 5.74	2.1138	23 8 6.5	4.728	15	9 55 15.10	1.9749	17 29 58.7	9.122
16	8 19 12.49	2.1112	23 3 19.6	4.834	16	9 57 13.51	1.9721	17 20 49.1	9.197
17	8 21 19.08	2.1085	22 58 26.4	4.939	17	9 59 11.75	1.9693	17 11 35.0	9.272
18	8 23 25.51	2.1058	22 53 26.9	5.043	18	10 1 9.82	1.9665	17 2 16.5	9.346
19	8 25 31.78	2.1031	22 48 21.2	5.147	19	10 3 7.73	1.9638	16 52 53.5	9.420
20	8 27 37.88	2.1003	22 43 9.3	5.250	20	10 5 5.48	1.9611	16 43 26.1	9.493
21	8 29 43.82	2.0976	22 37 51.2	5.353	21	10 7 3.06	1.9583	16 33 54.3	9.566
22	8 31 49.59	2.0948	22 32 26.9	5.456	22	10 9 0.48	1.9557	16 24 18.2	9.637
23	8 33 55.19	2.0919	N.22 26 56.5	5.557	23	10 10 57.75	1.9531	N.16 14 37.9	9.707
	WEDNESDAY 10.					**FRIDAY 12.**			
0	8 36 0.62	2.0891	N.22 21 20.1	5.658	0	10 12 54.86	1.9505	N.16 4 53.4	9.777
1	8 38 5.88	2.0862	22 15 37.6	5.758	1	10 14 51.81	1.9479	15 55 4.7	9.847
2	8 40 10.97	2.0834	22 9 49.1	5.858	2	10 16 48.61	1.9453	15 45 11.8	9.916
3	8 42 15.89	2.0805	22 3 54.6	5.958	3	10 18 45.25	1.9427	15 35 14.8	9.983
4	8 44 20.63	2.0776	21 57 54.1	6.056	4	10 20 41.74	1.9402	15 25 13.8	10.050
5	8 46 25.20	2.0747	21 51 47.8	6.154	5	10 22 38.08	1.9377	15 15 8.8	10.117
6	8 48 29.60	2.0718	21 45 35.6	6.252	6	10 24 34.27	1.9352	15 4 59.8	10.182
7	8 50 33.82	2.0689	21 39 17.6	6.349	7	10 26 30.31	1.9328	14 54 46.9	10.247
8	8 52 37.87	2.0660	21 32 53.7	6.446	8	10 28 26.21	1.9305	14 44 30.1	10.312
9	8 54 41.74	2.0630	21 26 24.0	6.542	9	10 30 21.97	1.9281	14 34 9.5	10.375
10	8 56 45.43	2.0600	21 19 48.6	6.637	10	10 32 17.58	1.9257	14 23 45.1	10.438
11	8 58 48.94	2.0571	21 13 7.6	6.731	11	10 34 13.05	1.9234	14 13 16.9	10.501
12	9 0 52.28	2.0542	21 6 20.9	6.826	12	10 36 8.39	1.9212	14 2 45.0	10.563
13	9 2 55.44	2.0512	20 59 28.5	6.919	13	10 38 3.59	1.9189	13 52 9.5	10.623
14	9 4 58.42	2.0482	20 52 30.6	7.012	14	10 39 58.66	1.9166	13 41 30.3	10.683
15	9 7 1.22	2.0452	20 45 27.1	7.104	15	10 41 53.59	1.9144	13 30 47.5	10.742
16	9 9 3.84	2.0422	20 38 18.1	7.196	16	10 43 48.39	1.9123	13 20 1.2	10.801
17	9 11 6.28	2.0392	20 31 3.6	7.287	17	10 45 43.07	1.9102	13 9 11.4	10.858
18	9 13 8.54	2.0362	20 23 43.7	7.377	18	10 47 37.62	1.9082	12 58 18.2	10.915
19	9 15 10.62	2.0332	20 16 18.4	7.467	19	10 49 32.05	1.9062	12 47 21.6	10.972
20	9 17 12.52	2.0302	20 8 47.7	7.556	20	10 51 26.36	1.9041	12 36 21.6	11.028
21	9 19 14.25	2.0273	20 1 11.7	7.644	21	10 53 20.54	1.9021	12 25 18.3	11.083
22	9 21 15.80	2.0243	19 53 30.4	7.731	22	10 55 14.61	1.9002	12 14 11.7	11.138
23	9 23 17.17	2.0213	19 45 43.9	7.818	23	10 57 8.56	1.8983	12 3 1.8	11.192
24	9 25 18.36	2.0183	N.19 37 52.2	7.905	24	10 59 2.40	1.8964	N.11 51 48.7	11.244

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 13.					**MONDAY 15.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	10 59 2.40	1.8964	N. 11 51 48.7	11.944	0	12 28 45.48	1.8606	N. 2 5 35.3	12.889
1	11 0 56.13	1.8946	11 40 32.5	11.296	1	12 30 37.13	1.8611	1 52 41.5	12.904
2	11 2 49.75	1.8928	11 29 13.2	11.347	2	12 32 28.81	1.8617	1 39 46.8	12.919
3	11 4 43.27	1.8911	11 17 50.9	11.397	3	12 34 20.53	1.8623	1 26 51.2	12.933
4	11 6 36.68	1.8894	11 6 25.6	11.447	4	12 36 12.29	1.8630	1 13 54.8	12.946
5	11 8 29.99	1.8877	10 54 57.3	11.496	5	12 38 4.09	1.8637	1 0 57.7	12.957
6	11 10 23.20	1.8861	10 43 26.1	11.544	6	12 39 55.93	1.8644	0 47 59.9	12.968
7	11 12 16.32	1.8845	10 31 52.0	11.592	7	12 41 47.82	1.8653	0 35 1.5	12.978
8	11 14 9.34	1.8829	10 20 15.1	11.639	8	12 43 39.77	1.8663	0 22 2.5	12.988
9	11 16 2.27	1.8814	10 8 35.4	11.685	9	12 45 31.78	1.8673	N. 0 9 2.9	12.997
10	11 17 55.11	1.8800	9 56 52.9	11.730	10	12 47 23.85	1.8683	S. 0 3 57.2	13.006
11	11 19 47.87	1.8786	9 45 7.8	11.774	11	12 49 15.98	1.8694	0 16 57.8	13.013
12	11 21 40.54	1.8772	9 33 20.0	11.818	12	12 51 8.18	1.8706	0 29 58.8	13.019
13	11 23 33.13	1.8759	9 21 29.6	11.862	13	12 53 0.45	1.8718	0 43 0.1	13.024
14	11 25 25.65	1.8747	9 9 36.6	11.904	14	12 54 52.79	1.8730	0 56 1.7	13.029
15	11 27 18.09	1.8734	8 57 41.1	11.945	15	12 56 45.21	1.8743	1 9 3.6	13.032
16	11 29 10.46	1.8722	8 45 43.2	11.986	16	12 58 37.71	1.8757	1 22 5.6	13.035
17	11 31 2.76	1.8711	8 33 42.8	12.027	17	13 0 30.30	1.8771	1 35 7.8	13.037
18	11 32 54.99	1.8699	8 21 40.0	12.066	18	13 2 22.97	1.8786	1 48 10.1	13.039
19	11 34 47.15	1.8689	8 9 34.9	12.104	19	13 4 15.73	1.8802	2 1 12.5	13.039
20	11 36 39.26	1.8680	7 57 27.5	12.142	20	13 6 8.59	1.8819	2 14 14.8	13.038
21	11 38 31.31	1.8670	7 45 17.8	12.180	21	13 8 1.56	1.8833	2 27 17.0	13.036
22	11 40 23.30	1.8661	7 33 5.9	12.216	22	13 9 54.63	1.8853	2 40 19.1	13.034
23	11 42 15.24	1.8652	N. 7 20 51.9	12.251	23	13 11 47.80	1.8871	S. 2 53 21.1	13.032
	SUNDAY 14.					**TUESDAY 16.**			
0	11 44 7.13	1.8644	N. 7 8 35.8	12.286	0	13 13 41.08	1.8890	S. 3 6 22.9	13.028
1	11 45 58.97	1.8637	6 56 17.6	12.320	1	13 15 34.48	1.8909	3 19 24.4	13.023
2	11 47 50.77	1.8630	6 43 57.4	12.353	2	13 17 27.99	1.8928	3 32 25.6	13.017
3	11 49 42.53	1.8623	6 31 35.2	12.386	3	13 19 21.62	1.8949	3 45 26.4	13.010
4	11 51 34.25	1.8617	6 19 11.0	12.418	4	13 21 15.38	1.8971	3 58 26.8	13.002
5	11 53 25.94	1.8611	6 6 45.0	12.448	5	13 23 9.27	1.8993	4 11 26.7	12.994
6	11 55 17.59	1.8606	5 54 17.2	12.478	6	13 25 3.29	1.9015	4 24 26.1	12.985
7	11 57 9.21	1.8602	5 41 47.6	12.508	7	13 26 57.45	1.9037	4 37 24.9	12.974
8	11 59 0.81	1.8598	5 29 16.2	12.537	8	13 28 51.74	1.9060	4 50 23.0	12.963
9	12 0 52.39	1.8595	5 16 43.1	12.565	9	13 30 46.17	1.9084	5 3 20.5	12.952
10	12 2 43.95	1.8592	5 4 8.4	12.592	10	13 32 40.75	1.9110	5 16 17.3	12.939
11	12 4 35.49	1.8589	4 51 32.1	12.618	11	13 34 35.49	1.9136	5 29 13.2	12.924
12	12 6 27.02	1.8587	4 38 54.2	12.644	12	13 36 30.38	1.9162	5 42 8.2	12.909
13	12 8 18.54	1.8586	4 26 14.8	12.668	13	13 38 25.43	1.9188	5 55 2.3	12.894
14	12 10 10.05	1.8584	4 13 34.0	12.692	14	13 40 20.64	1.9215	6 7 55.5	12.877
15	12 12 1.55	1.8584	4 0 51.7	12.716	15	13 42 16.01	1.9243	6 20 47.6	12.859
16	12 13 53.06	1.8585	3 48 8.0	12.739	16	13 44 11.55	1.9272	6 33 38.6	12.841
17	12 15 44.57	1.8585	3 35 23.0	12.760	17	13 46 7.27	1.9301	6 46 28.5	12.822
18	12 17 36.08	1.8586	3 22 36.8	12.780	18	13 48 3.16	1.9330	6 59 17.2	12.801
19	12 19 27.60	1.8588	3 9 49.4	12.800	19	13 49 59.23	1.9361	7 12 4.6	12.779
20	12 21 19.14	1.8591	2 57 0.8	12.820	20	13 51 55.49	1.9392	7 24 50.7	12.757
21	12 23 10.69	1.8594	2 44 11.0	12.839	21	13 53 51.93	1.9423	7 37 35.5	12.734
22	12 25 2.26	1.8598	2 31 20.1	12.857	22	13 55 48.56	1.9455	7 50 18.8	12.709
23	12 26 53.86	1.8602	2 18 28.2	12.873	23	13 57 45.39	1.9488	8 3 0.6	12.684
24	12 28 45.48	1.8606	N. 2 5 35.3	12.889	24	13 59 42.41	1.9521	S. 8 15 40.9	12.658

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 17.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	13 59 42.41	1.9521	S. 8 15 40.9	12.658
1	14 1 39.64	1.9555	8 28 19.6	12.631
2	14 3 37.07	1.9589	8 40 56.6	12.602
3	14 5 34.71	1.9625	8 53 31.8	12.572
4	14 7 32.57	1 9661	9 6 5.2	12.542
5	14 9 30.64	1.9697	9 18 36.9	12.512
6	14 11 28.93	1.9734	9 31 6.7	12.480
7	14 13 27.45	1.9771	9 43 34.5	12.446
8	14 15 26.19	1.9809	9 56 0.2	12.411
9	14 17 25.16	1.9848	10 8 23.8	12.376
10	14 19 24.37	1.9887	10 20 45.3	12.340
11	14 21 23.81	1.9927	10 33 4.6	12.302
12	14 23 23.49	1.9968	10 45 21.6	12.263
13	14 25 23.42	2.0009	10 57 36.2	12.224
14	14 27 23.60	2.0051	11 9 48.5	12.184
15	14 29 24.03	2.0093	11 21 58.3	12.142
16	14 31 24.71	2.0136	11 34 5.5	12.099
17	14 33 25.66	2.0180	11 46 10.2	12.056
18	14 35 26.87	2.0224	11 58 12.2	12.011
19	14 37 28.35	2.0268	12 10 11.5	11.965
20	14 39 30.09	2.0312	12 22 8.0	11.917
21	14 41 32.10	2.0358	12 34 1.6	11.869
22	14 43 34.39	2.0405	12 45 52.3	11.820
23	14 45 36.96	2.0452	S. 12 57 40.0	11.769

THURSDAY 18.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	14 47 39.81	2.0499	S. 13 9 24.6	11.717
1	14 49 42.95	2.0547	13 21 6.1	11.665
2	14 51 46.38	2.0595	13 32 44.4	11.612
3	14 53 50.09	2.0643	13 44 19.5	11.557
4	14 55 54.10	2.0693	13 55 51.2	11.500
5	14 57 58.41	2.0744	14 7 19.5	11.443
6	15 0 3.03	2.0795	14 18 44.4	11.385
7	15 2 7.95	2.0846	14 30 5.7	11.325
8	15 4 13.18	2.0897	14 41 23.4	11.264
9	15 6 18.71	2.0949	14 52 37.4	11.203
10	15 8 24.56	2.1001	15 3 47.7	11.140
11	15 10 30.72	2.1053	15 14 54.2	11.075
12	15 12 37.20	2.1107	15 25 56.7	11.009
13	15 14 44.00	2.1161	15 36 55.3	10.943
14	15 16 51.13	2.1215	15 47 49.9	10.875
15	15 18 58.58	2.1269	15 58 40.3	10.805
16	15 21 6.36	2.1324	16 9 26.5	10.735
17	15 23 14.47	2.1379	16 20 8.5	10.665
18	15 25 22.91	2.1435	16 30 46.3	10.593
19	15 27 31.69	2.1492	16 41 19.6	10.518
20	15 29 40.81	2.1548	16 51 48.4	10.443
21	15 31 50.27	2.1605	17 2 12.7	10.366
22	15 34 0.07	2.1662	17 12 32.3	10.288
23	15 36 10.22	2.1720	17 22 47.2	10.209
24	15 38 20.71	2.1778	S. 17 32 57.4	10.129

FRIDAY 19.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	15 38 20.71	2.1778	S. 17 32 57.4	10.129
1	15 40 31.55	2.1836	17 43 2.7	10.047
2	15 42 42.74	2.1895	17 53 3.1	9.965
3	15 44 54.29	2.1954	18 2 58.5	9.881
4	15 47 6.19	2.2013	18 12 48.8	9.796
5	15 49 18.45	2.2073	18 22 34.0	9.709
6	15 51 31.07	2.2132	18 32 13.9	9.621
7	15 53 44.04	2.2192	18 41 48.5	9.532
8	15 55 57.38	2.2253	18 51 17.7	9.442
9	15 58 11.08	2.2313	19 0 41.5	9.351
10	16 0 25.14	2.2373	19 9 59.8	9.258
11	16 2 39.56	2.2434	19 19 12.4	9.163
12	16 4 54.35	2.2495	19 28 19.3	9.068
13	16 7 9.50	2.2556	19 37 20.5	8.971
14	16 9 25.02	2.2617	19 46 15.8	8.872
15	16 11 40.91	2.2679	19 55 5.1	8.772
16	16 13 57.17	2.2740	20 3 48.4	8.672
17	16 16 13.79	2.2802	20 12 25.7	8.570
18	16 18 30.79	2.2864	20 20 56.8	8.466
19	16 20 48.16	2.2925	20 29 21.6	8.362
20	16 23 5.89	2.2986	20 37 40.2	8.257
21	16 25 23.99	2.3047	20 45 52.4	8.149
22	16 27 42.46	2.3109	20 53 58.1	8.040
23	16 30 1.30	2.3171	S. 21 1 57.2	7.929

SATURDAY 20.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	16 32 20.51	2.3232	S. 21 9 49.6	7.818
1	16 34 40.09	2.3294	21 17 35.3	7.706
2	16 37 0.04	2.3355	21 25 14.3	7.592
3	16 39 20.35	2.3416	21 32 46.4	7.477
4	16 41 41.03	2.3477	21 40 11.6	7.361
5	16 44 2.08	2.3538	21 47 29.7	7.243
6	16 46 23.49	2.3598	21 54 40.7	7.124
7	16 48 45.26	2.3658	22 1 44.6	7.004
8	16 51 7.39	2.3719	22 8 41.2	6.882
9	16 53 29.89	2.3779	22 15 30.4	6.759
10	16 55 52.74	2.3838	22 22 12.2	6.635
11	16 58 15.95	2.3898	22 28 46.6	6.510
12	17 0 39.52	2.3957	22 35 13.4	6.383
13	17 3 3.44	2.4016	22 41 32.5	6.255
14	17 5 27.71	2.4074	22 47 44.0	6.127
15	17 7 52.33	2.4132	22 53 47.7	5.996
16	17 10 17.30	2.4190	22 59 43.5	5.864
17	17 12 42.61	2.4247	23 5 31.4	5.731
18	17 15 8.26	2.4303	23 11 11.2	5.596
19	17 17 34.25	2.4359	23 16 42.9	5.461
20	17 20 0.57	2.4415	23 22 6.5	5.325
21	17 22 27.23	2.4471	23 27 21.9	5.187
22	17 24 54.22	2.4525	23 32 29.0	5.049
23	17 27 21.53	2.4578	23 37 27.8	4.909
24	17 29 49.16	2.4632	S. 23 42 18.1	4.768

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	17 29 49.16	2.4632	S.23 42 18.1	4.768
1	17 32 17.11	2.4685	23 46 59.9	4.626
2	17 34 45.38	2.4737	23 51 33.2	4.482
3	17 37 13.96	2.4788	23 55 57.8	4.337
4	17 39 42.84	2.4838	24 0 13.7	4.192
5	17 42 12.02	2.4888	24 4 20.8	4.045
6	17 44 41.50	2.4938	24 8 19.1	3.897
7	17 47 11.28	2.4987	24 12 8.5	3.749
8	17 49 41.34	2.5034	24 15 49.0	3.599
9	17 52 11.68	2.5080	24 19 20.4	3.448
10	17 54 42.30	2.5127	24 22 42.7	3.296
11	17 57 13.20	2.5173	24 25 55.9	3.144
12	17 59 44.37	2.5217	24 29 0.0	2.991
13	18 2 15.80	2.5260	24 31 54.8	2.836
14	18 4 47.49	2.5302	24 34 40.3	2.680
15	18 7 19.43	2.5344	24 37 16.4	2.523
16	18 9 51.62	2.5384	24 39 43.1	2.366
17	18 12 24.04	2.5423	24 42 0.3	2.208
18	18 14 56.69	2.5461	24 44 8.1	2.050
19	18 17 29.57	2.5499	24 46 6.3	1.890
20	18 20 2.68	2.5536	24 47 54.9	1.729
21	18 22 36.00	2.5571	24 49 33.8	1.567
22	18 25 9.53	2.5606	24 51 3.0	1.405
23	18 27 43.27	2.5639	S.24 52 22.4	1.243

MONDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	18 30 17.20	2.5671	S.24 53 32.1	1.080
1	18 32 51.32	2.5702	24 54 32.0	0.916
2	18 35 25.63	2.5732	24 55 22.0	0.751
3	18 38 0.11	2.5761	24 56 2.1	0.585
4	18 40 34.76	2.5788	24 56 32.2	0.419
5	18 43 9.57	2.5814	24 56 52.4	0.253
6	18 45 44.53	2.5839	24 57 2.6	− 0.086
7	18 48 19.64	2.5863	24 57 2.8	+ 0.081
8	18 50 54.89	2.5887	24 56 52.9	0.248
9	18 53 30.28	2.5908	24 56 33.0	0.416
10	18 56 5.79	2.5928	24 56 3.0	0.585
11	18 58 41.42	2.5948	24 55 22.8	0.755
12	19 1 17.17	2.5967	24 54 32.4	0.924
13	19 3 53.02	2.5983	24 53 31.9	1.093
14	19 6 28.96	2.5998	24 52 21.2	1.263
15	19 9 4.99	2.6012	24 51 0.3	1.433
16	19 11 41.10	2.6025	24 49 29.2	1.604
17	19 14 17.29	2.6037	24 47 47.8	1.775
18	19 16 53.54	2.6047	24 45 56.2	1.946
19	19 19 29.85	2.6056	24 43 54.3	2.117
20	19 22 6.21	2.6063	24 41 42.2	2.287
21	19 24 42.61	2.6070	24 39 19.9	2.457
22	19 27 19.05	2.6076	24 36 47.3	2.628
23	19 29 55.52	2.6080	24 34 4.5	2.799
24	19 32 32.01	2.6082	S.24 31 11.4	2.971

TUESDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	19 32 32.01	2.6082	S.24 31 11.4	2.971
1	19 35 8.51	2.6084	24 28 8.0	3.142
2	19 37 45.02	2.6085	24 24 54.4	3.312
3	19 40 21.53	2.6084	24 21 30.6	3.482
4	19 42 58.03	2.6082	24 17 56.5	3.653
5	19 45 34.51	2.6078	24 14 12.2	3.823
6	19 48 10.96	2.6073	24 10 17.7	3.993
7	19 50 47.38	2.6067	24 6 13.0	4.163
8	19 53 23.76	2.6060	24 1 58.1	4.332
9	19 56 0.10	2.6052	23 57 33.1	4.502
10	19 58 36.38	2.6043	23 52 57.9	4.670
11	20 1 12.61	2.6033	23 48 12.7	4.838
12	20 3 48.77	2.6021	23 43 17.4	5.006
13	20 6 24.86	2.6007	23 38 12.0	5.173
14	20 9 0.86	2.5992	23 32 56.6	5.339
15	20 11 36.77	2.5977	23 27 31.3	5.505
16	20 14 12.58	2.5961	23 21 56.0	5.671
17	20 16 48.30	2.5944	23 16 10.8	5.836
18	20 19 23.91	2.5925	23 10 15.7	6.000
19	20 21 59.40	2.5905	23 4 10.8	6.164
20	20 24 34.77	2.5885	22 57 56.1	6.327
21	20 27 10.02	2.5864	22 51 31.6	6.469
22	20 29 45.14	2.5842	22 44 57.4	6.650
23	20 32 20.12	2.5818	S.22 38 13.6	6.810

WEDNESDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	20 34 54.95	2.5793	S.22 31 20.2	6.969
1	20 37 29.63	2.5767	22 24 17.3	7.128
2	20 40 4.15	2.5741	22 17 4.8	7.287
3	20 42 38.52	2.5714	22 9 42.8	7.445
4	20 45 12.72	2.5685	22 2 11.4	7.601
5	20 47 46.74	2.5656	21 54 30.7	7.755
6	20 50 20.59	2.5627	21 46 40.8	7.909
7	20 52 54.26	2.5596	21 38 41.7	8.062
8	20 55 27.74	2.5564	21 30 33.4	8.214
9	20 58 1.03	2.5532	21 22 16.0	8.365
10	21 0 34.13	2.5499	21 13 49.6	8.515
11	21 3 7.02	2.5465	21 5 14.2	8.663
12	21 5 39.71	2.5431	20 56 30.0	8.810
13	21 8 12.19	2.5396	20 47 37.0	8.957
14	21 10 44.46	2.5360	20 38 35.2	9.102
15	21 13 16.51	2.5324	20 29 24.7	9.246
16	21 15 48.34	2.5287	20 20 5.7	9.388
17	21 18 19.95	2.5249	20 10 38.2	9.529
18	21 20 51.33	2.5211	20 1 2.2	9.669
19	21 23 22.48	2.5172	19 51 17.9	9.807
20	21 25 53.40	2.5133	19 41 25.3	9.945
21	21 28 24.08	2.5093	19 31 24.5	10.081
22	21 30 54.52	2.5053	19 21 15.6	10.215
23	21 33 24.72	2.5012	19 10 58.7	10.348
24	21 35 54.67	2.4971	S.19 0 33.8	10.480

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 25.					**SATURDAY 27.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	21 35 54.67	2.4971	S. 19 0 33.8	10.480	0	23 30 49.36	2.2952	S. 8 37 1.0	14.828
1	21 38 24.37	2.4930	18 50 1.1	10.609	1	23 33 6.96	2.2916	8 22 9.9	14.875
2	21 40 53.83	2.4889	18 39 20.7	10.737	2	23 35 24.35	2.2881	8 7 16.0	14.920
3	21 43 23.04	2.4847	18 28 32.6	10.865	3	23 37 41.53	2.2846	7 52 19.5	14.962
4	21 45 51.99	2.4804	18 17 36.9	10.991	4	23 39 58.50	2.2811	7 37 20.5	15.003
5	21 48 20.69	2.4762	18 6 33.7	11.115	5	23 42 15.26	2.2776	7 22 19.1	15.042
6	21 50 49.14	2.4720	17 55 23.1	11.237	6	23 44 31.81	2.2743	7 7 15.4	15.080
7	21 53 17.33	2.4677	17 44 5.2	11.358	7	23 46 48.17	2.2710	6 52 9.5	15.116
8	21 55 45.26	2.4633	17 32 40.1	11.477	8	23 49 4.33	2.2677	6 37 1.5	15.150
9	21 58 12.92	2.4589	17 21 7.9	11.595	9	23 51 20.29	2.2644	6 21 51.5	15.182
10	22 0 40.32	2.4545	17 9 28.7	11.711	10	23 53 36.06	2.2613	6 6 39.7	15.212
11	22 3 7.46	2.4501	16 57 42.6	11.826	11	23 55 51.65	2.2582	5 51 26.1	15.240
12	22 5 34.34	2.4457	16 45 49.6	11.939	12	23 58 7.05	2.2552	5 36 10.9	15.267
13	22 8 0.95	2.4413	16 33 49.9	12.050	13	0 0 22.27	2.2522	5 20 54.1	15.292
14	22 10 27.30	2.4370	16 21 43.6	12.159	14	0 2 37.31	2.2493	5 5 35.9	15.314
15	22 12 53.39	2.4326	16 9 30.8	12.267	15	0 4 52.18	2.2464	4 50 16.4	15.335
16	22 15 19.21	2.4281	15 57 11.6	12.373	16	0 7 6.88	2.2436	4 34 55.7	15.354
17	22 17 44.76	2.4237	15 44 46.0	12.477	17	0 9 21.41	2.2408	4 19 33.9	15.373
18	22 20 10.05	2.4192	15 32 14.3	12.573	18	0 11 35.77	2.2380	4 4 11.0	15.389
19	22 22 35.07	2.4148	15 19 36.5	12.681	19	0 13 49.97	2.2353	3 48 47.2	15.402
20	22 24 59.83	2.4104	15 6 52.6	12.781	20	0 16 4.01	2.2327	3 33 22.7	15.414
21	22 27 24.32	2.4060	14 54 2.8	12.878	21	0 18 17.90	2.2302	3 17 57.5	15.425
22	22 29 48.55	2.4016	14 41 7.2	12.973	22	0 20 31.64	2.2277	3 2 31.7	15.434
23	22 32 12.51	2.3972	S. 14 28 6.0	13.067	23	0 22 45.23	2.2253	S. 2 47 5.4	15.442
	FRIDAY 26.					**SUNDAY 28.**			
0	22 34 36.21	2.3928	S. 14 14 59.2	13.159	0	0 24 58.68	2.2230	S. 2 31 38.7	15.447
1	22 36 59.65	2.3884	14 1 46.9	13.250	1	0 27 11.99	2.2206	2 16 11.7	15.451
2	22 39 22.82	2.3840	13 48 29.2	13.338	2	0 29 25.16	2.2183	2 0 44.6	15.452
3	22 41 45.73	2.3797	13 35 6.3	13.425	3	0 31 38.19	2.2161	1 45 17.4	15.452
4	22 44 8.38	2.3754	13 21 38.2	13.511	4	0 33 51.09	2.2140	1 29 50.3	15.451
5	22 46 30.78	2.3711	13 8 5.0	13.594	5	0 36 3.87	2.2120	1 14 23.3	15.448
6	22 48 52.92	2.3668	12 54 26.9	13.675	6	0 38 16.53	2.2100	0 58 56.5	15.443
7	22 51 14.80	2.3626	12 40 44.0	13.755	7	0 40 29.07	2.2080	0 43 30.1	15.437
8	22 53 36.43	2.3584	12 26 56.3	13.833	8	0 42 41.49	2.2061	0 28 4.1	15.429
9	22 55 57.81	2.3541	12 13 4.0	13.909	9	0 44 53.80	2.2042	S. 0 12 38.6	15.420
10	22 58 18.93	2.3499	11 59 7.2	13.983	10	0 47 6.00	2.2024	N. 0 2 46.3	15.408
11	23 0 39.80	2.3458	11 45 6.0	14.055	11	0 49 18.09	2.2007	0 18 10.4	15.395
12	23 3 0.43	2.3417	11 31 0.6	14.125	12	0 51 30.08	2.1990	0 33 33.7	15.381
13	23 5 20.81	2.3377	11 16 51.0	14.194	13	0 53 41.97	2.1974	0 48 56.1	15.365
14	23 7 40.95	2.3336	11 2 37.3	14.262	14	0 55 53.77	2.1959	1 4 17.5	15.347
15	23 10 0.84	2.3295	10 48 19.6	14.327	15	0 58 5.48	2.1944	1 19 37.7	15.327
16	23 12 20.49	2.3256	10 33 58.1	14.389	16	1 0 17.10	2.1929	1 34 56.7	15.306
17	23 14 39.91	2.3217	10 19 32.9	14.451	17	1 2 28.63	2.1915	1 50 14.4	15.283
18	23 16 59.09	2.3178	10 5 4.0	14.511	18	1 4 40.08	2.1902	2 5 30.7	15.259
19	23 19 18.04	2.3139	9 50 31.6	14.568	19	1 6 51.46	2.1890	2 20 45.5	15.234
20	23 21 36.76	2.3100	9 35 55.8	14.623	20	1 9 2.76	2.1878	2 35 58.7	15.207
21	23 23 55.24	2.3062	9 21 16.8	14.677	21	1 11 13.99	2.1866	2 51 10.3	15.178
22	23 26 13.50	2.3025	9 6 34.6	14.729	22	1 13 25.15	2.1855	3 6 20.1	15.147
23	23 28 31.54	2.2988	8 51 49.3	14.780	23	1 15 36.25	2.1845	3 21 28.0	15.115
24	23 30 49.36	2.2952	S. 8 37 1.0	14.828	24	1 17 47.29	2.1835	N. 3 36 33.9	15.082

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	1 17 47.29	2.1835	N. 3 36 33.9	15.082
1	1 19 58.27	2.1826	3 51 37.8	15.047
2	1 22 9.20	2.1817	4 6 39.6	15.011
3	1 24 20.08	2.1809	4 21 39.1	14.972
4	1 26 30.91	2.1801	4 36 36.3	14.933
5	1 28 41.69	2.1793	4 51 31.1	14.893
6	1 30 52.43	2.1787	5 6 23.5	14.852
7	1 33 3.14	2.1782	5 21 13.4	14.808
8	1 35 13.81	2.1776	5 36 0.5	14.762
9	1 37 24.45	2.1771	5 50 44.8	14.715
10	1 39 35.06	2.1767	6 5 26.3	14.668
11	1 41 45.65	2.1762	6 20 5.0	14.620
12	1 43 56.21	2.1758	6 34 40.7	14.569
13	1 46 6.75	2.1756	6 49 13.3	14.517
14	1 48 17.28	2.1754	7 3 42.8	14.464
15	1 50 27.80	2.1752	7 18 9.0	14.409
16	1 52 38.31	2.1751	7 32 31.9	14.353
17	1 54 48.81	2.1749	7 46 51.4	14.296
18	1 56 59.30	2.1748	8 1 7.4	14.237
19	1 59 9.79	2.1749	8 15 19.9	14.178
20	2 1 20.29	2.1750	8 29 28.8	14.117
21	2 3 30.79	2.1751	8 43 33.9	14.054
22	2 5 41.30	2.1752	8 57 35.3	13.991
23	2 7 51.82	2.1753	N. 9 11 32.9	13.927

TUESDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	2 10 2.34	2.1755	N. 9 25 26.5	13.860
1	2 12 12.88	2.1758	9 39 16.1	13.793
2	2 14 23.44	2.1762	9 53 1.7	13.725
3	2 16 34.02	2.1765	10 6 43.1	13.655
4	2 18 44.62	2.1768	10 20 20.3	13.584
5	2 20 55.24	2.1772	10 33 53.2	13.512
6	2 23 5.89	2.1777	10 47 21.7	13.438
7	2 25 16.57	2.1782	11 0 45.8	13.364
8	2 27 27.28	2.1787	11 14 5.4	13.289
9	2 29 38.02	2.1793	11 27 20.5	13.213
10	2 31 48.80	2.1800	11 40 31.0	13.136
11	2 33 59.62	2.1806	11 53 36.8	13.056
12	2 36 10.47	2.1812	12 6 37.7	12.975
13	2 38 21.36	2.1819	12 19 33.8	12.895
14	2 40 32.30	2.1827	12 32 25.1	12.813
15	2 42 43.28	2.1834	12 45 11.4	12.730
16	2 44 54.31	2.1842	12 57 52.7	12.646
17	2 47 5.39	2.1851	13 10 28.9	12.561
18	2 49 16.52	2.1859	13 23 0.0	12.475
19	2 51 27.70	2.1868	13 35 25.9	12.387
20	2 53 38.94	2.1877	13 47 46.5	12.299
21	2 55 50.23	2.1887	14 0 1.8	12.211
22	2 58 1.58	2.1896	14 12 11.8	12.121
23	3 0 12.98	2.1905	14 24 16.3	12.029
24	3 2 24.44	2.1915	N.14 36 15.3	11.937

WEDNESDAY, OCTOBER 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	3 2 24.44	2.1915	N.14 36 15.3	11.937

PHASES OF THE MOON.

		d	h	m
☾ Last Quarter . .	Sept.	5	15	29.4
● New Moon		13	19	53.0
☽ First Quarter . . .		21	10	5.4
○ Full Moon		28	0	59.7

		d	h
☾ Apogee. . . .	Sept.	10	11.4
☾ Perigee.		26	3.8

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	α Aquilæ	W.	75° 53′ 44″	2993	77° 24′ 5″	2999	78° 54′ 19″	3005	80° 24′ 25″	3014
	Jupiter	W.	67 42 4	2186	69 30 53	2202	71 19 17	2219	73 7 16	2236
	Fomalhaut	W.	41 6 33	2629	42 44 49	2618	44 23 19	2610	46 2 1	2606
	Aldebaran	E.	56 50 19	2225	55 2 28	2242	53 15 3	2260	51 28 4	2277
	Pollux	E.	100 58 4	2217	99 10 2	2233	97 22 23	2250	95 35 10	2266
2	α Aquilæ	W.	87 51 24	3083	89 19 54	3102	90 48 1	3121	92 15 45	3141
	Jupiter	W.	82 0 47	2324	83 46 11	2343	85 31 7	2362	87 15 37	2381
	Fomalhaut	W.	54 15 57	2617	55 54 29	2624	57 32 52	2633	59 11 2	2642
	α Pegasi	W.	40 28 6	3435	41 49 41	3381	43 12 16	3335	44 35 45	3298
	Aldebaran	E.	42 39 57	2374	40 55 45	2395	39 12 3	2416	37 28 51	2438
	Pollux	E.	86 45 25	2355	85 0 46	2375	83 16 35	2393	81 32 50	2412
3	α Aquilæ	W.	99 27 47	3262	100 52 43	3290	102 17 6	3319	103 40 56	3349
	Jupiter	W.	95 51 21	2475	97 33 10	2493	99 14 32	2512	100 55 28	2531
	Fomalhaut	W.	67 18 13	2704	68 54 48	2718	70 31 4	2732	72 7 1	2747
	α Pegasi	W.	51 42 4	3188	53 8 28	3175	54 35 7	3167	56 1 56	3161
	Pollux	E.	73 0 49	2507	71 19 45	2525	69 39 7	2545	67 58 56	2564
	Sun	E.	121 36 1	2842	120 2 27	2862	118 29 19	2882	116 56 36	2901
4	Fomalhaut	W.	80 1 44	2826	81 35 38	2842	83 9 12	2858	84 42 25	2874
	α Pegasi	W.	63 17 0	3159	64 43 58	3163	66 10 51	3168	67 37 38	3175
	α Arietis	W.	20 26 22	3820	21 41 4	3677	22 58 15	3566	24 17 26	3480
	Pollux	E.	59 44 29	2657	58 6 51	2675	56 29 38	2693	54 52 49	2710
	Sun	E.	109 19 9	2997	107 48 52	3016	106 18 59	3035	104 49 28	3053
5	Fomalhaut	W.	92 23 19	2955	93 54 28	2972	95 25 16	2987	96 55 45	3003
	α Pegasi	W.	74 49 27	3214	76 15 19	3224	77 41 0	3234	79 6 29	3244
	α Arietis	W.	31 12 15	3242	32 37 35	3220	34 3 21	3201	35 29 29	3187
	Pollux	E.	46 54 31	2797	45 19 59	2813	43 45 49	2829	42 11 59	2845
	Sun	E.	97 27 30	3141	96 0 10	3157	94 33 9	3173	93 6 28	3189
6	α Pegasi	W.	86 10 50	3299	87 35 3	3310	88 59 4	3321	90 22 50	3333
	α Arietis	W.	42 43 22	3153	44 10 28	3151	45 37 37	3149	47 4 47	3149
	Pollux	E.	34 27 58	2924	32 56 9	2939	31 24 40	2954	29 53 30	2969
	Sun	E.	85 57 38	3264	84 32 44	3277	83 8 5	3290	81 43 41	3302
7	α Pegasi	W.	97 18 20	3393	98 40 45	3405	100 2 56	3418	101 24 52	3430
	α Arietis	W.	54 20 21	3158	55 47 20	3160	57 14 17	3163	58 41 10	3166
	Aldebaran	W.	22 39 2	3059	24 8 2	3060	25 37 1	3061	27 5 59	3063
	Sun	E.	74 45 14	3359	73 22 11	3369	71 59 19	3379	70 36 39	3388
8	α Arietis	W.	65 54 47	3179	67 21 21	3181	68 47 51	3183	70 14 19	3185
	Aldebaran	W.	34 30 9	3076	35 58 48	3079	37 27 25	3082	38 55 58	3085
	Sun	E.	63 45 43	3428	62 23 58	3434	61 2 20	3440	59 40 49	3446
9	α Arietis	W.	77 26 4	3195	78 52 19	3196	80 18 33	3197	81 44 46	3197
	Aldebaran	W.	46 17 59	3094	47 46 16	3095	49 14 31	3096	50 42 45	3096
	Sun	E.	52 54 46	3470	51 33 48	3474	50 12 55	3477	48 52 6	3480
10	α Arietis	W.	88 55 40	3199	90 21 50	3198	91 48 1	3198	93 14 12	3198
	Aldebaran	W.	58 3 48	3097	59 32 1	3096	61 0 15	3095	62 28 31	3094

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1	α Aquilæ	W.	81° 54′ 19″	3026	83° 24′ 0″	3039	84° 53′ 25″	3052	86° 22′ 34″	3067
	Jupiter	W.	74 54 50	2253	76 41 58	2270	78 28 41	2288	80 14 57	2306
	Fomalhaut	W.	47 40 48	2603	49 19 39	2603	50 58 30	2607	52 37 16	2610
	Aldebaran	E.	49 41 31	2296	47 55 26	2315	46 9 48	2334	44 24 38	2354
	Pollux	E.	93 48 21	2284	92 1 58	2302	90 16 1	2320	88 30 30	2337
2	α Aquilæ	W.	93 43 5	3163	95 9 59	3186	96 36 24	3210	98 2 21	3236
	Jupiter	W.	88 59 40	2400	90 43 15	2418	92 26 24	2437	94 9 6	2456
	Fomalhaut	W.	60 49 0	2654	62 26 42	2666	64 4 10	2678	65 41 20	2690
	α Pegasi	W.	45 59 56	3268	47 24 48	3242	48 50 9	3220	50 15 57	3204
	Aldebaran	E.	35 46 10	2458	34 3 58	2481	32 22 18	2506	30 41 13	2530
	Pollux	E.	79 49 32	2431	78 6 41	2449	76 24 16	2469	74 42 19	2488
3	α Aquilæ	W.	105 4 11	3380	106 26 51	3413	107 48 53	3446	109 10 18	3481
	Jupiter	W.	102 35 58	2550	104 16 2	2568	105 55 41	2587	107 34 54	2604
	Fomalhaut	W.	73 42 38	2763	75 17 55	2777	76 52 51	2793	78 27 28	2809
	α Pegasi	W.	57 28 54	3158	58 55 54	3156	60 22 57	3156	61 50 0	3158
	Pollux	E.	66 19 12	2583	64 39 53	2601	63 1 0	2620	61 22 32	2638
	Sun	E.	115 24 17	2920	113 52 24	2940	112 20 54	2960	110 49 50	2979
4	Fomalhaut	W.	86 15 17	2890	87 47 49	2907	89 19 59	2923	90 51 49	2939
	α Pegasi	W.	69 4 17	3181	70 30 49	3189	71 57 11	3197	73 23 24	3205
	α Arietis	W.	25 38 12	3408	27 0 19	3352	28 23 30	3308	29 47 32	3273
	Pollux	E.	53 16 23	2729	51 40 21	2746	50 4 42	2763	48 29 26	2780
	Sun	E.	103 20 21	3071	101 51 36	3089	100 23 13	3107	98 55 11	3124
5	Fomalhaut	W.	98 25 54	3018	99 55 44	3034	101 25 14	3050	102 54 25	3066
	α Pegasi	W.	80 31 46	3254	81 56 51	3265	83 21 43	3276	84 46 23	3287
	α Arietis	W.	36 55 54	3175	38 22 33	3166	39 49 23	3161	41 16 19	3155
	Pollux	E.	40 38 31	2861	39 5 22	2877	37 32 35	2893	36 0 7	2909
	Sun	E.	91 40 6	3205	90 14 3	3220	88 48 18	3235	87 22 49	3250
6	α Pegasi	W.	91 46 24	3345	93 9 44	3357	94 32 50	3369	95 55 42	3381
	α Arietis	W.	48 31 57	3150	49 59 6	3152	51 26 13	3154	52 53 18	3156
	Pollux	E.	28 22 39	2985	26 52 9	3001	25 22 0	3017	23 52 12	3034
	Sun	E.	80 19 33	3314	78 55 38	3326	77 31 57	3337	76 8 29	3348
7	α Pegasi	W.	102 46 35	3444	104 8 2	3456	105 29 16	3470	106 50 14	3482
	α Arietis	W.	60 8 0	3169	61 34 46	3171	63 1 30	3174	64 28 10	3176
	Aldebaran	W.	28 34 54	3064	30 3 48	3066	31 32 39	3069	33 1 26	3073
	Sun	E.	69 14 9	3397	67 51 49	3405	66 29 38	3413	65 7 36	3421
8	α Arietis	W.	71 40 45	3188	73 7 8	3190	74 33 28	3192	75 59 47	3193
	Aldebaran	W	40 24 28	3087	41 52 54	3089	43 21 18	3091	44 49 39	3093
	Sun	E.	58 19 25	3452	56 58 7	3457	55 36 55	3462	54 15 48	3466
9	α Arietis	W.	83 10 58	3198	84 37 9	3198	86 3 19	3199	87 29 30	3199
	Aldebaran	W.	52 10 59	3098	53 39 11	3098	55 7 23	3098	56 35 35	3097
	Sun	E.	47 31 19	3483	46 10 36	3486	44 49 56	3488	43 29 19	3490
10	α Arietis	W.	94 40 24	3197	96 6 37	3196	97 32 50	3195	98 59 5	3194
	Aldebaran	W.	63 56 48	3092	65 25 7	3090	66 53 28	3088	68 21 52	3086

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10	Sun E.	42° 8′ 44″	3492	40° 48′ 11″	3494	39° 27′ 40″	3496	38° 7′ 12″	3498
11	Aldebaran W.	69 50 18	3083	71 18 48	3081	72 47 21	3078	74 15 57	3075
	Sun E.	31 25 17	3507	30 5 1	3509	28 44 48	3513	27 24 39	3517
15	Sun W.	14 1 28	3522	15 21 28	3482	16 42 12	3445	18 3 38	3409
	Antares E.	63 5 0	2928	61 33 17	2921	60 1 26	2914	58 29 27	2906
	Mars E.	79 24 7	3124	77 56 26	3117	76 28 37	3110	75 0 38	3102
16	Sun W.	24 59 16	3288	26 23 41	3271	27 48 27	3256	29 13 30	3240
	Antares E.	50 47 26	2876	49 14 37	2870	47 41 41	2864	46 8 36	2858
	Mars E.	67 38 26	3062	66 9 30	3054	64 40 25	3046	63 11 9	3038
	α Aquilæ E.	98 18 26	3602	96 59 54	3589	95 41 8	3577	94 22 9	3566
	Jupiter E.	104 24 15	2835	102 50 32	2828	101 16 40	2820	99 42 37	2812
17	Sun W.	36 23 2	3173	37 49 43	3161	39 16 38	3149	40 43 49	3137
	Antares E.	38 21 17	2831	36 47 29	2825	35 13 34	2821	33 39 34	2818
	Mars E.	55 42 16	2995	54 11 57	2986	52 41 27	2977	51 10 45	2968
	α Aquilæ E.	87 44 29	3524	86 24 31	3517	85 4 26	3512	83 44 15	3508
	Jupiter E.	91 49 43	2770	90 14 36	2762	88 39 18	2754	87 3 48	2746
18	Sun W.	48 3 15	3078	49 31 52	3066	51 0 42	3054	52 29 47	3042
	Spica W.	21 44 20	2881	23 17 3	2853	24 50 22	2828	26 24 14	2802
	Mars E.	43 34 24	2921	42 2 32	2911	40 30 28	2901	38 58 11	2891
	α Aquilæ E.	77 2 33	3502	75 42 11	3504	74 21 51	3506	73 1 34	3511
	Jupiter E.	79 3 22	2698	77 26 40	2689	75 49 46	2680	74 12 38	2670
19	Sun W.	59 58 51	2984	61 29 24	2972	63 0 14	2960	64 31 18	2947
	Spica W.	34 21 5	2702	35 57 42	2685	37 34 42	2669	39 12 3	2654
	Jupiter E.	66 3 44	2621	64 25 17	2611	62 46 35	2600	61 7 39	2589
	α Aquilæ E.	66 22 0	3558	65 2 40	3572	63 43 35	3590	62 24 50	3610
	Fomalhaut E.	96 9 36	2803	94 35 12	2791	93 0 33	2780	91 25 39	2769
20	Sun W.	72 10 34	2884	73 43 13	2871	75 16 9	2858	76 49 22	2845
	Spica W.	47 23 53	2581	49 3 14	2567	50 42 54	2553	52 22 52	2539
	Venus W.	25 59 34	2984	27 30 4	2962	29 1 4	2940	30 32 32	2920
	Jupiter E.	52 49 18	2534	51 8 52	2523	49 28 12	2512	47 47 16	2500
	α Aquilæ E.	55 57 21	3754	54 41 31	3794	53 26 23	3840	52 12 2	3891
	Fomalhaut E.	83 27 33	2716	81 51 14	2706	80 14 41	2695	78 37 55	2686
	α Pegasi E.	101 22 2	2958	99 50 57	2942	98 19 32	2927	96 47 48	2912
21	Sun W.	84 39 38	2780	86 14 32	2767	87 49 45	2754	89 25 14	2740
	Spica W.	60 47 29	2472	62 29 21	2459	64 11 31	2446	65 54 0	2433
	Venus W.	38 16 8	2826	39 50 2	2809	41 24 17	2793	42 58 54	2776
	Jupiter E.	39 18 38	2445	37 36 8	2434	35 53 22	2423	34 10 20	2412
	Fomalhaut E.	70 30 59	2642	68 53 2	2635	67 14 54	2628	65 36 38	2622
	α Pegasi E.	89 4 40	2848	87 31 15	2837	85 57 34	2826	84 23 40	2817
22	Sun W.	97 27 4	2674	99 4 19	2661	100 41 51	2648	102 19 41	2636
	Spica W.	74 31 2	2368	76 15 22	2356	77 59 59	2344	79 44 55	2332
	Venus W.	50 57 17	2698	52 33 59	2683	54 11 1	2669	55 48 23	2654
	Antares W.	28 44 33	2422	30 27 37	2403	32 11 9	2384	33 55 8	2366

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10	Sun	E.	36° 46′ 45″	3499	35° 26′ 20″	3501	34° 5′ 57″	3503	32° 45′ 36″	3506
11	Aldebaran	W.	75 44 38	3072	77 13 22	3068	78 42 11	3064	80 11 4	3060
	Sun	E.	26 4 34	3523	24 44 35	3529	23 24 43	3536	22 4 59	3545
15	Sun	W.	19 25 42	3377	20 48 22	3349	22 11 35	3327	23 35 14	3307
	Antares	E.	56 57 19	2902	55 25 3	2895	53 52 39	2888	52 20 7	2882
	Mars	E.	73 32 30	3094	72 4 13	3086	70 35 47	3078	69 7 11	3070
16	Sun	W.	30 38 52	3225	32 4 31	3212	33 30 25	3199	34 56 36	3186
	Antares	E.	44 35 23	2852	43 2 3	2846	41 28 34	2841	39 54 59	2836
	Mars	E.	61 41 44	3030	60 12 8	3022	58 42 21	3013	57 12 24	3004
	α Aquilæ	E.	93 2 58	3555	91 43 35	3546	90 24 2	3538	89 4 20	3530
	Jupiter	E.	98 8 23	2804	96 34 0	2796	94 59 25	2788	93 24 40	2779
17	Sun	W.	42 11 13	3125	43 38 52	3113	45 6 46	3101	46 34 53	3089
	Antares	E.	32 5 29	2815	30 31 22	2812	28 57 10	2811	27 22 57	2812
	Mars	E.	49 39 52	2959	48 8 48	2950	46 37 32	2941	45 6 4	2931
	α Aquilæ	E.	82 24 0	3506	81 3 41	3503	79 43 20	3501	78 22 57	3500
	Jupiter	E.	85 28 6	2735	83 52 13	2726	82 16 8	2717	80 39 51	2708
18	Sun	W.	53 59 7	3031	55 28 41	3020	56 58 29	3008	58 28 33	2996
	Spica	W.	27 58 39	2778	29 33 36	2757	31 9 1	2738	32 44 51	2719
	Mars	E.	37 25 41	2881	35 52 58	2871	34 20 3	2861	32 46 54	2851
	α Aquilæ	E.	71 41 23	3517	70 21 18	3525	69 1 21	3534	67 41 34	3545
	Jupiter	E.	72 35 18	2660	70 57 45	2651	69 19 58	2642	67 41 58	2631
19	Sun	W.	66 2 37	2934	67 34 13	2922	69 6 4	2910	70 38 11	2897
	Spica	W.	40 49 45	2639	42 27 47	2624	44 6 10	2609	45 44 52	2595
	Jupiter	E.	59 28 28	2578	57 49 3	2567	56 9 23	2556	54 29 28	2545
	α Aquilæ	E.	61 6 25	3632	59 48 25	3657	58 30 52	3686	57 13 50	3717
	Fomalhaut	E.	89 50 31	2758	88 15 8	2747	86 39 30	2736	85 3 38	2726
20	Sun	W.	78 22 51	2832	79 56 37	2819	81 30 40	2806	83 5 0	2793
	Spica	W.	54 3 10	2526	55 43 47	2512	57 24 42	2498	59 5 56	2485
	Venus	W.	32 4 25	2899	33 36 45	2880	35 9 29	2862	36 42 37	2844
	Jupiter	E.	46 6 4	2489	44 24 36	2478	42 42 53	2467	41 0 54	2456
	α Aquilæ	E.	50 58 33	3949	49 46 3	4014	48 34 37	4085	47 24 21	4168
	Fomalhaut	E.	77 0 56	2677	75 23 45	2668	73 46 21	2659	72 8 46	2650
	α Pegasi	E.	95 15 45	2898	93 43 24	2884	92 10 46	2872	90 37 51	2860
21	Sun	W.	91 1 1	2726	92 37 6	2713	94 13 28	2700	95 50 7	2687
	Spica	W.	67 36 47	2420	69 19 53	2407	71 3 18	2394	72 47 1	2381
	Venus	W.	44 33 53	2760	46 9 13	2744	47 44 54	2729	49 20 55	2713
	Jupiter	E.	32 27 3	2401	30 43 30	2390	28 59 44	2381	27 15 42	2372
	Fomalhaut	E.	63 58 12	2616	62 19 39	2610	60 40 58	2607	59 2 12	2603
	α Pegasi	E.	82 49 33	2808	81 15 15	2800	79 40 45	2792	78 6 6	2785
22	Sun	W.	103 57 48	2624	105 36 11	2611	107 14 52	2598	108 53 49	2586
	Spica	W	81 30 9	2320	83 15 40	2308	85 1 29	2296	86 47 35	2284
	Venus	W.	57 26 4	2640	59 4 4	2626	60 42 23	2612	62 21 1	2598
	Antares	W.	35 39 32	2348	37 24 1	2333	39 9 33	2317	40 55 8	2302

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22	Fomalhaut	E.	57° 23′ 21″	2601	55° 44′ 28″	2600	54° 5′ 33″	2600	52° 26′ 38″	2601
	α Pegasi	E.	76 31 17	2779	74 56 21	2773	73 21 18	2769	71 46 10	2767
23	Sun	W.	110 33 4	2574	112 12 34	2562	113 52 20	2551	115 32 21	2540
	Spica	W.	88 33 59	2272	90 20 39	2261	92 7 35	2250	93 54 48	2239
	Venus	W.	63 59 57	2585	65 39 12	2572	67 18 44	2560	68 58 34	2548
	Antares	W.	42 41 5	2288	44 27 22	2274	46 13 59	2261	48 0 56	2248
	Fomalhaut	E.	44 13 30	2642	42 35 32	2658	40 57 56	2679	39 20 48	2705
	α Pegasi	E.	63 50 11	2774	62 15 9	2780	60 40 15	2788	59 5 32	2800
24	Sun	W.	123 56 9	2491	125 37 35	2483	127 19 13	2475	129 1 2	2467
	Venus	W.	77 21 49	2491	79 3 15	2481	80 44 54	2472	82 26 47	2462
	Antares	W.	57 0 12	2192	58 48 52	2182	60 37 48	2172	62 26 57	2163
	Mars	W.	34 52 16	2799	36 36 45	2789	38 21 28	2779	40 6 23	2769
	α Pegasi	E.	51 16 46	2900	49 44 27	2931	48 12 48	2969	46 41 57	3013
	α Arietis	E.	91 22 22	2283	89 35 57	2274	87 49 19	2265	86 2 28	2256
25	Venus	W.	90 59 13	2424	92 42 14	2418	94 25 23	2412	96 8 40	2407
	Antares	W.	71 35 55	2125	73 26 16	2120	75 16 45	2115	77 7 22	2110
	Mars	W.	48 54 1	2729	50 40 3	2723	52 26 14	2716	54 12 32	2711
	α Arietis	E.	77 5 47	2231	75 18 6	2227	73 30 18	2224	71 42 26	2223
	Aldebaran	E.	107 35 18	2120	105 44 49	2114	103 54 11	2109	102 3 25	2104
26	Antares	W.	86 21 56	2095	88 13 3	2094	90 4 11	2094	91 55 19	2094
	Mars	W.	63 5 28	2695	64 52 14	2694	66 39 2	2694	68 25 50	2694
	Jupiter	W.	32 50 15	2090	34 41 29	2088	36 32 47	2087	38 24 7	2086
	α Arietis	E.	62 42 56	2229	60 55 12	2233	59 7 34	2240	57 20 6	2247
	Aldebaran	E.	92 48 10	2090	90 56 56	2089	89 5 41	2089	87 14 24	2090
27	Antares	W.	101 10 33	2107	103 1 22	2111	104 52 5	2116	106 42 40	2122
	α Aquilæ	W.	58 42 17	3168	60 9 5	3133	61 36 35	3101	63 4 44	3074
	Jupiter	W.	47 40 37	2094	49 31 45	2097	51 22 47	2102	53 13 43	2108
	α Arietis	E.	48 26 9	2308	46 40 21	2325	44 54 58	2346	43 10 5	2369
	Aldebaran	E.	77 58 34	2101	76 7 36	2106	74 16 46	2111	72 26 3	2117
28	α Aquilæ	W.	70 32 20	2989	72 2 47	2980	73 33 25	2974	75 4 10	2971
	Jupiter	W.	62 26 2	2143	64 15 56	2152	66 5 35	2162	67 55 0	2172
	Aldebaran	E.	63 15 1	2155	61 25 26	2165	59 36 6	2175	57 47 1	2186
	Pollux	E.	107 22 35	2148	105 32 49	2158	103 43 18	2166	101 53 59	2176
29	α Aquilæ	W.	82 38 7	2985	84 8 39	2993	85 39 0	3003	87 9 9	3016
	Jupiter	W.	76 57 57	2231	78 45 38	2244	80 32 58	2258	82 19 59	2272
	Fomalhaut	W.	48 36 2	2543	50 16 16	2539	51 56 35	2538	53 36 55	2540
	Aldebaran	E.	48 46 6	2251	46 58 54	2266	45 12 5	2282	43 25 39	2298
	Pollux	E.	92 51 30	2235	91 3 55	2248	89 16 39	2262	87 29 43	2276
30	α Aquilæ	W.	94 35 30	3099	96 3 41	3120	97 31 26	3143	98 58 44	3167
	Jupiter	W.	91 9 36	2350	92 54 23	2367	94 38 46	2382	96 22 45	2398
	Fomalhaut	W.	61 57 22	2569	63 37 0	2578	65 16 24	2588	66 55 35	2600
	α Pegasi	W.	46 50 31	3162	48 17 26	3134	49 44 54	3111	51 12 50	3094
	Aldebaran	E.	34 39 43	2390	32 55 54	2411	31 12 35	2432	29 29 46	2456
	Pollux	E.	78 40 29	2353	76 55 46	2369	75 11 27	2386	73 27 32	2402

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Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff	XXIh.	P. L. of Diff.
22	Fomalhaut	E.	50° 47′ 45″	2604	49° 8′ 57″	2610	47° 30′ 17″	2618	45° 51′ 46″	2629
	α Pegasi	E.	70 10 59	2765	68 35 45	2765	67 0 31	2766	65 25 19	2769
23	Sun	W.	117 12 38	2530	118 53 10	2520	120 33 56	2510	122 14 56	2500
	Spica	W.	95 42 16	2229	97 30 0	2219	99 17 59	2210	101 6 12	2200
	Venus	W.	70 38 41	2536	72 19 4	2524	73 59 44	2513	75 40 39	2502
	Antares	W.	49 48 13	2236	51 35 47	2224	53 23 39	2213	55 11 47	2202
	Fomalhaut	E.	37 44 15	2737	36 8 24	2774	34 33 22	2820	32 59 20	2875
	α Pegasi	E.	57 31 4	2813	55 56 53	2830	54 23 4	2849	52 49 40	2873
24	Sun	W.	130 43 2	2460	132 25 11	2453	134 7 30	2448	135 49 56	2443
	Venus	W.	84 8 53	2453	85 51 12	2445	87 33 41	2438	89 16 22	2431
	Antares	W.	64 16 21	2155	66 5 57	2147	67 55 45	2139	69 45 45	2132
	Mars	W.	41 51 32	2760	43 36 53	2752	45 22 25	2743	47 8 8	2736
	α Pegasi	E.	45 12 0	3062	43 43 4	3119	42 15 18	3187	40 48 53	3265
	α Arietis	E.	84 15 27	2251	82 28 15	2245	80 40 53	2239	78 53 23	2235
25	Venus	W.	97 52 4	2403	99 35 34	2400	101 19 9	2397	103 2 48	2395
	Antares	W.	78 58 6	2106	80 48 56	2102	82 39 51	2098	84 30 53	2096
	Mars	W.	55 58 58	2707	57 45 29	2703	59 32 5	2700	61 18 45	2697
	α Arietis	E.	69 54 29	2222	68 6 34	2222	66 18 39	2223	64 30 46	2225
	Aldebaran	E.	100 12 33	2100	98 21 34	2097	96 30 30	2094	94 39 22	2092
26	Antares	W.	93 46 27	2096	95 37 33	2097	97 28 37	2099	99 19 37	2103
	Mars	W.	70 12 37	2695	71 59 22	2696	73 46 6	2698	75 32 45	2700
	Jupiter	W.	40 15 28	2087	42 6 48	2088	43 58 7	2089	45 49 24	2091
	α Arietis	E.	55 32 48	2256	53 45 43	2266	51 58 53	2278	50 12 21	2292
	Aldebaran	E.	85 23 9	2091	83 31 56	2093	81 40 43	2095	79 49 36	2097
27	Antares	W.	108 33 7	2128	110 23 23	2135	112 13 29	2143	114 3 22	2151
	α Aquilæ	W.	64 33 25	3050	66 2 36	3030	67 32 11	3014	69 2 7	3000
	Jupiter	W.	55 4 31	2114	56 55 9	2120	58 45 38	2127	60 35 56	2135
	α Arietis	E.	41 25 46	2396	39 42 5	2425	37 59 6	2460	36 16 56	2498
	Aldebaran	E.	70 35 29	2123	68 45 5	2130	66 54 51	2138	65 4 50	2146
28	α Aquilæ	W.	76 34 59	2969	78 5 50	2970	79 36 40	2973	81 7 27	2978
	Jupiter	W.	69 44 9	2182	71 33 3	2194	73 21 39	2206	75 9 57	2218
	Aldebaran	E.	55 58 13	2198	54 9 43	2210	52 21 31	2223	50 33 38	2237
	Pollux	E.	100 4 56	2187	98 16 9	2198	96 27 39	2209	94 39 25	2222
29	α Aquilæ	W.	88 39 2	3029	90 8 39	3044	91 37 57	3060	93 6 55	3079
	Jupiter	W.	84 6 39	2287	85 52 57	2302	87 38 52	2318	89 24 25	2334
	Fomalhaut	W.	55 17 12	2543	56 57 26	2548	58 37 33	2553	60 17 33	2561
	Aldebaran	E.	41 39 37	2315	39 53 59	2333	38 8 47	2350	36 24 1	2370
	Pollux	E.	85 43 8	2291	83 56 55	2306	82 11 4	2321	80 25 35	2337
30	α Aquilæ	W.	100 25 33	3193	101 51 50	3220	103 17 36	3248	104 42 48	3279
	Jupiter	W.	98 6 20	2417	99 49 31	2435	101 32 16	2452	103 14 37	2469
	Fomalhaut	W.	68 34 30	2612	70 13 8	2624	71 51 30	2638	73 29 32	2652
	α Pegasi	W.	52 41 7	3078	54 9 43	3068	55 38 32	3059	57 7 32	3054
	Aldebaran	E.	27 47 30	2482	26 5 53	2507	24 24 50	2535	22 44 26	2565
	Pollux	E.	71 44 0	2420	70 0 54	2437	68 18 12	2455	66 35 55	2472

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Wed.	1	12 30 16.28	9.056	S. 3 16 13.7	-58.22	16 1.49	64.36	10 22.79	0.798
Thur.	2	12 33 53.77	9.069	3 39 29.9	58.13	16 1.76	64.41	10 41.79	0.785
Frid.	3	12 37 31.58	9.083	4 2 43.7	58.02	16 2.04	64.46	11 0.47	0.771
Sat.	4	12 41 9.74	9 098	4 25 54.9	-57.90	16 2.31	64.50	11 18.81	0.756
SUN.	5	12 44 48.27	9.114	4 49 2.9	57.76	16 2.59	64.56	11 36.79	0.740
Mon.	6	12 48 27.19	9.131	5 12 7.5	57.60	16 2.86	64.62	11 54.37	0.723
Tues.	7	12 52 6.53	9.148	5 35 8.2	-57.43	16 3.13	64.68	12 11.54	0.706
Wed.	8	12 55 46.30	9.167	5 58 4.8	57.26	16 3.40	64.74	12 28.28	0.687
Thur.	9	12 59 26.52	9.186	6 20 56.9	57.07	16 3.68	64.81	12 44.57	0.668
Frid.	10	13 3 7.20	9.206	6 43 44.0	-56.86	16 3.95	64.88	13 0.39	0.648
Sat.	11	13 6 48.37	9.226	7 6 25.8	56.63	16 4.22	64.95	13 15.74	0.628
SUN.	12	13 10 30.04	9.247	7 29 1.9	56.38	16 4.49	65.02	13 30.58	0.607
Mon.	13	13 14 12.22	9.268	7 51 32.0	-56.12	16 4.77	65.09	13 44.91	0.586
Tues.	14	13 17 54.93	9.290	8 13 55.6	55.84	16 5.04	65.17	13 58.71	0.564
Wed.	15	13 21 38.18	9.313	8 36 12.2	55.54	16 5.32	65.25	14 11.98	0.541
Thur.	16	13 25 21.99	9.337	8 58 21.4	-55.22	16 5.59	65.33	14 24.68	0.517
Frid.	17	13 29 6.38	9.361	9 20 23.0	54.89	16 5.87	65.42	14 36.81	0.493
Sat.	18	13 32 51.35	9.386	9 42 16.4	54.55	16 6.14	65.51	14 48.36	0.468
SUN.	19	13 36 36.93	9.412	10 4 1.3	-54.18	16 6.42	65.60	14 59.31	0.442
Mon.	20	13 40 23.12	9.438	10 25 37.3	53.80	16 6.69	65.70	15 9.64	0.416
Tues.	21	13 44 9.95	9.464	10 47 3.8	53.40	16 6.97	65.80	15 19.35	0.390
Wed.	22	13 47 57.42	9.491	11 8 20.6	-52.99	16 7.24	65.90	15 28.41	0.363
Thur.	23	13 51 45.55	9.520	11 29 27.3	52.56	16 7.52	66.00	15 36.81	0.335
Frid.	24	13 55 34.36	9.549	11 50 23.4	52.11	16 7.79	66.10	15 44.52	0.306
Sat.	25	13 59 23.87	9.578	12 11 8.6	-51.65	16 8.06	66.21	15 51.55	0.277
SUN.	26	14 3 14.10	9.608	12 31 42.5	51.17	16 8.32	66.31	15 57.87	0.247
Mon.	27	14 7 5.06	9.639	12 52 4.8	50.67	16 8.58	66.42	16 3.45	0.216
Tues.	28	14 10 56.76	9.670	13 12 15.0	-50.16	16 8.84	66.53	16 8.28	0.185
Wed.	29	14 14 49.21	9.702	13 32 12.8	49.63	16 9.10	66.64	16 12.37	0.153
Thur.	30	14 18 42.44	9.735	13 51 57.7	49.09	16 9.35	66.75	16 15.69	0.120
Frid.	31	14 22 36.47	9.768	14 11 29.4	48.53	16 9.59	66.86	16 18.22	0.087
Sat.	32	14 26 31.31	9.802	S. 14 30 47.5	-47.96	16 9.83	66.97	16 19.94	0.053

NOTE.—The mean time of semidiameter passing may be found by subtracting 0s.18 from the sidereal time.

The sign prefixed to the hourly change of declination indicates that south declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination	THE SUN'S Diff. for 1 Hour.	Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Wed.	1	12 30 17.85	9.058	S. 3 16 23.8	–58.23	10 22.91	0.798	12 40 40.76
Thur.	2	12 33 55.39	9.071	3 39 40.3	58.14	10 41.92	0.785	12 44 37.31
Frid.	3	12 37 33.25	9.085	4 2 54.4	58.03	11 0.61	0.771	12 48 33.86
Sat.	4	12 41 11.46	9.100	4 26 5.8	–57.91	11 18.95	0.756	12 52 30.41
SUN.	5	12 44 50.04	9.116	4 49 14.1	57.77	11 36.93	0.740	12 56 26.97
Mon.	6	12 48 29.01	9.133	5 12 18.9	57.61	11 54.51	0.723	13 0 23.52
Tues.	7	12 52 8.39	9.150	5 35 19.9	–57.44	12 11.68	0 706	13 4 20.08
Wed.	8	12 55 48.21	9.169	5 58 16.7	57.27	12 28.42	0.687	13 8 16.63
Thur.	9	12 59 28.47	9.188	6 21 9.0	57.08	12 44.71	0.668	13 12 13.18
Frid.	10	13 3 9.20	9.208	6 43 56.3	–56.87	13 0.53	0.648	13 16 9.73
Sat.	11	13 6 50.41	9.228	7 6 38.3	56.64	13 15.88	0.628	13 20 6.29
SUN.	12	13 10 32.12	9.249	7 29 14.6	56.39	13 30.72	0.607	13 24 2.84
Mon.	13	13 14 14.35	9.270	7 51 44.8	–56.13	13 45.05	0.586	13 27 59.40
Tues.	14	13 17 57.10	9.292	8 14 8.5	55.85	13 58.85	0.564	13 31 55.95
Wed.	15	13 21 40.39	9.315	8 36 25.3	55.55	14 12.11	0.541	13 35 52.50
Thur.	16	13 25 24.24	9.339	8 58 34.7	–55.23	14 24.81	0.517	13 39 49.05
Frid.	17	13 29 8.67	9.363	9 20 36.4	54.90	14 36.94	0.493	13 43 45.61
Sat.	18	13 32 53.68	9.388	9 42 29.9	54.55	14 48.48	0.468	13 47 42.16
SUN.	19	13 36 39.29	9.414	10 4 14.9	–54.18	14 59.42	0.442	13 51 38 72
Mon.	20	13 40 25.52	9.440	10 25 50.9	53.80	15 9.75	0.416	13 55 35.27
Tues.	21	13 44 12.38	9.466	10 47 17.5	53.40	15 19.45	0.390	13 59 31.83
Wed.	22	13 47 59.88	9.493	11 8 34.3	–52.99	15 28.50	0.363	14 3 28.38
Thur.	23	13 51 48.04	9.521	11 29 41.0	52.56	15 36.89	0.335	14 7 24.93
Frid.	24	13 55 36.88	9.550	11 50 37.1	52.11	15 44.60	0.306	14 11 21.48
Sat.	25	13 59 26.42	9.579	12 11 22.3	–51.65	15 51.62	0.277	14 15 18.04
SUN.	26	14 3 16.67	9.609	12 31 56.2	51.17	15 57.93	0.247	14 19 14.60
Mon.	27	14 7 7.65	9.640	12 52 18.4	50.67	16 3.50	0.216	14 23 11.15
Tues.	28	14 10 59.37	9.671	13 12 28.5	–50.16	16 8.33	0.185	14 27 7.70
Wed.	29	14 14 51.84	9.703	13 32 26.2	49.63	16 12.41	0.153	14 31 4.26
Thur.	30	14 18 45.09	9.736	13 52 11.0	49.09	16 15.72	0.120	14 35 0.81
Frid.	31	14 22 39.13	9.769	14 11 42.6	48.53	16 18.24	0.087	14 38 57.37
Sat.	32	14 26 33.98	9.803	S. 14 31 0.6	–47.96	16 19 95	0.053	14 42 53.92

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

Diff. for 1 hour,
$+9^{s}.8565$.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ′	THE SUN'S Diff. for 1 Hour.	THE SUN'S LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	274	188° 15′ 11″.8	14′ 51″.3	147″.61	− 0″.50	0.0002264	−51.4	11 17 27.96
2	275	189 14 15.6	13 55.0	147.70	0.39	0.0001033	51.3	11 13 32.05
3	276	190 13 21.7	13 1.0	147.79	0.27	9.9999805	51.1	11 9 36.14
4	277	191 12 30.0	12 9.2	147.89	− 0.14	9.9998580	−51.0	11 5 40.23
5	278	192 11 40.6	11 19.7	147.99	0.00	9.9997357	50.9	11 1 44.33
6	279	193 10 53.6	10 32.6	148.09	+ 0.11	9.9996135	50.9	10 57 48.42
7	280	194 10 9.0	9 47.9	148.19	+ 0.21	9.9994913	−50.9	10 53 52.51
8	281	195 9 26.7	9 5.5	148.29	0.29	9.9993690	51.0	10 49 56.60
9	282	196 8 46.7	8 25.4	148.38	0.35	9.9992466	51.1	10 46 0.69
10	283	197 8 8.9	7 47.5	148.47	+ 0.38	9.9991239	−51.2	10 42 4.79
11	284	198 7 33.3	7 11.8	148.56	0.38	9.9990009	51.3	10 38 8.88
12	285	199 7 0.0	6 38.4	148.65	0.34	9.9988775	51.4	10 34 12.97
13	286	200 6 28.8	6 7.1	148.73	+ 0.28	9.9987540	−51.5	10 30 17.06
14	287	201 5 59.6	5 37.8	148.82	0.19	9.9986301	51.6	10 26 21.16
15	288	202 5 32.4	5 10.5	148.90	+ 0.08	9.9985059	51.8	10 22 25.25
16	289	203 5 7.1	4 45.1	148.98	− 0.04	9.9983815	−51.9	10 18 29.34
17	290	204 4 43.7	4 21.5	149.06	0.17	9.9982570	51.9	10 14 33.43
18	291	205 4 22.1	3 59.8	149.14	0.30	9.9981326	51.8	10 10 37.53
19	292	206 4 2.3	3 39.9	149.21	− 0.43	9.9980084	−51.7	10 6 41.62
20	293	207 3 44.2	3 21.7	149.28	0.55	9.9978845	51.5	10 2 45.71
21	294	208 3 27.9	3 5.3	149.35	0.65	9.9977610	51.3	9 58 49.80
22	295	209 3 13.3	2 50.5	149.43	− 0.72	9.9976382	−51.0	9 54 53.90
23	296	210 3 0.4	2 37.5	149.50	0.77	9.9975163	50.6	9 50 57.99
24	297	211 2 49.1	2 26.1	149.57	0.79	9.9973954	50.2	9 47 2.08
25	298	212 2 39.5	2 16.4	149.64	− 0.77	9.9972756	−49.7	9 43 6.17
26	299	213 2 31.7	2 8.5	149.72	0.73	9.9971570	49.2	9 39 10.26
27	300	214 2 25.7	2 2.3	149.79	0.66	9.9970396	48.6	9 35 14.35
28	301	215 2 21.5	1 58.0	149.87	− 0.57	9.9969237	−48.0	9 31 18.44
29	302	216 2 19.2	1 55.6	149.94	0.46	9.9968093	47.4	9 27 22.53
30	303	217 2 18.9	1 55.2	150.02	0.33	9.9966964	46.8	9 23 26.63
31	304	218 2 20.7	1 56.9	150.11	0.20	9.9965850	46.1	9 19 30.72
32	305	219 2 24.5	2 0.6	150.20	− 0.06	9.9964750	−45.5	9 15 34.81

Note.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January $0^{d}.0$.

Diff. for 1 Hour,
— $9^{s}.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 49.5	15 42.2	57 57.8	−2.20	57 31.3	−2.21	14 52.0	2.12	17.2
2	15 35.0	15 28.0	57 4.9	2.17	56 39.3	2.09	15 43.2	2.14	18.2
3	15 21.4	15 15.1	56 14.8	1.98	55 51.9	1.84	16 34.9	2.16	19.2
4	15 9.4	15 4.2	55 30.8	−1.67	55 11.8	−1.49	17 26.8	2.14	20.2
5	14 59.7	14 55.8	54 55.2	1.29	54 41.0	1.09	18 17.8	2.10	21.2
6	14 52.6	14 50.2	54 29.3	0.87	54 20.2	0.65	19 7.5	2.03	22.2
7	14 48.4	14 47.3	54 13.7	−0.44	54 9.7	−0.24	19 55.5	1.95	23.2
8	14 46.9	14 47.1	54 8.1	−0.04	54 8.9	+0.16	20 41.1	1.87	24.2
9	14 47.9	14 49.3	54 11.9	+0.34	54 16.9	0.50	21 25.1	1.80	25.2
10	14 51.1	14 53.5	54 23.8	+0.65	54 32.4	+0.78	22 7.7	1.77	26.2
11	14 56.2	14 59.3	54 42.5	0.90	54 53.9	1.00	22 50.0	1.76	27.2
12	15 2.7	15 6.4	55 6.4	1.09	55 19.8	1.15	23 32.3	1.79	28.2
13	15 10.2	15 14.2	55 33.8	+1.19	55 48.3	+1.22	6		29.2
14	15 18.2	15 22.2	56 3.1	1.24	56 18.0	1.25	0 15.8	1.87	0.5
15	15 26.3	15 30.4	56 33.0	1.25	56 47.9	1.24	1 1.4	1.96	1.5
16	15 34.4	15 38.4	57 2.7	+1.22	57 17.2	+1.20	1 49.8	2.09	2.5
17	15 42.2	15 46.0	57 31.4	1.17	57 45.3	1.15	2 41.7	2.24	3.5
18	15 49.7	15 53.3	57 58.9	1.12	58 12.1	1.09	3 37.2	2.37	4.5
19	15 56.8	16 0.1	58 24.9	+1.05	58 37.2	+1.01	4 35.5	2.46	5.5
20	16 3.4	16 6.4	58 49.0	0.96	59 0.1	0.90	5 35.3	2.48	6.5
21	16 9.2	16 11.7	59 10.4	0.82	59 19.7	0.73	6 34.8	2.43	7.5
22	16 13.9	16 15.7	59 27.8	+0.62	59 34.5	+0.49	7 32.1	2.33	8.5
23	16 17.1	16 17.9	59 39.4	+0.34	59 42.4	+0.16	8 26.9	2.23	9.5
24	16 18.1	16 17.7	59 43.2	−0.04	59 41.6	−0.24	9 19.2	2.14	10.5
25	16 16.6	16 14.7	59 37.5	−0.46	59 30.7	−0.68	10 9.7	2.08	11.5
26	16 12.2	16 8.9	59 21.3	0.90	59 9.2	1.11	10 59.2	2.06	12.5
27	16 4.9	16 0.3	58 54.7	1.31	58 37.9	1.48	11 48.7	2.08	13.5
28	15 55.2	15 49.7	58 19.2	−1.63	57 59.0	−1.74	12 39.0	2.12	14.5
29	15 43.9	15 37.9	57 37.6	1.82	57 15.5	1.86	13 30.4	2.17	15.5
30	15 31.8	15 25.8	56 53.1	1.86	56 30.9	1.83	14 23.0	2.20	16.5
31	15 19.9	15 14.3	56 9.3	1.77	55 48.7	1.67	15 15.9	2.20	17.5
32	15 9.0	15 4.2	55 29.4	−1.54	55 11.8	−1.39	16 8.4	2.16	18.5

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 1.

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.
	h	m	s	s	°	′	″	″
0	3	2	24.44	2.1915	N.14	36	15.3	11.937
1	3	4	35.96	2.1926	14	48	8.7	11.844
2	3	6	47.55	2.1937	14	59	56.6	11.751
3	3	8	59.20	2.1947	15	11	38.8	11.656
4	3	11	10.91	2.1957	15	23	15.3	11.560
5	3	13	22.69	2.1968	15	34	46.0	11.463
6	3	15	34.53	2.1979	15	46	10.9	11.366
7	3	17	46.44	2.1991	15	57	29.9	11.268
8	3	19	58.42	2.2002	16	8	43.0	11.169
9	3	22	10.46	2.2013	16	19	50.2	11.069
10	3	24	22.57	2.2024	16	30	51.3	10.968
11	3	26	34.75	2.2036	16	41	46.3	10.867
12	3	28	47.01	2.2049	16	52	35.3	10.765
13	3	30	59.34	2.2060	17	3	18.1	10.661
14	3	33	11.73	2.2072	17	13	54.6	10.557
15	3	35	24.20	2.2084	17	24	24.9	10.452
16	3	37	36.74	2.2096	17	34	48.9	10.347
17	3	39	49.35	2.2108	17	45	6.5	10.241
18	3	42	2.04	2.2121	17	55	17.8	10.134
19	3	44	14.80	2.2133	18	5	22.6	10.026
20	3	46	27.63	2.2144	18	15	20.9	9.917
21	3	48	40.53	2.2156	18	25	12.7	9.809
22	3	50	53.50	2.2168	18	34	58.0	9.700
23	3	53	6.55	2.2181	N.18	44	36.7	9.590

THURSDAY 2.

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.
0	3	55	19.67	2.2193	N.18	54	8.8	9.479
1	3	57	32.86	2.2204	19	3	34.2	9.367
2	3	59	46.12	2.2216	19	12	52.8	9.254
3	4	1	59.45	2.2227	19	22	4.7	9.141
4	4	4	12.85	2.2239	19	31	9.8	9.027
5	4	6	26.32	2.2251	19	40	8.0	8.913
6	4	8	39.87	2.2263	19	48	59.4	8.799
7	4	10	53.48	2.2274	19	57	43.9	8.684
8	4	13	7.16	2.2285	20	6	21.5	8.568
9	4	15	20.90	2.2296	20	14	52.1	8.452
10	4	17	34.71	2.2307	20	23	15.7	8.335
11	4	19	48.59	2.2318	20	31	32.3	8.218
12	4	22	2.53	2.2328	20	39	41.9	8.101
13	4	24	16.53	2.2338	20	47	44.4	7.982
14	4	26	30.59	2.2349	20	55	39.7	7.863
15	4	28	44.72	2.2360	21	3	27.9	7.743
16	4	30	58.91	2.2369	21	11	8.9	7.623
17	4	33	13.15	2.2378	21	18	42.7	7.504
18	4	35	27.45	2.2387	21	26	9.4	7.384
19	4	37	41.80	2.2397	21	33	28.8	7.263
20	4	39	56.21	2.2406	21	40	40.9	7.141
21	4	42	10.67	2.2414	21	47	45.7	7.019
22	4	44	25.18	2.2423	21	54	43.2	6.897
23	4	46	39.74	2.2431	22	1	33.3	6.774
24	4	48	54.35	2.2438	N.22	8	16.1	6.651

FRIDAY 3.

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.
	h	m	s	s	°	′	″	″
0	4	48	54.35	2.2438	N.22	8	16.1	6.651
1	4	51	9.00	2.2445	22	14	51.5	6.528
2	4	53	23.69	2.2452	22	21	19.5	6.404
3	4	55	38.43	2.2459	22	27	40.0	6.280
4	4	57	53.20	2.2465	22	33	53.1	6.157
5	5	0	8.01	2.2472	22	39	58.8	6.033
6	5	2	22.86	2.2478	22	45	57.0	5.908
7	5	4	37.74	2.2483	22	51	47.7	5.783
8	5	6	52.65	2.2487	22	57	30.9	5.657
9	5	9	7.58	2.2491	23	3	6.5	5.531
10	5	11	22.54	2.2495	23	8	34.6	5.406
11	5	13	37.52	2.2499	23	13	55.2	5.280
12	5	15	52.53	2.2503	23	19	8.2	5.153
13	5	18	7.56	2.2506	23	24	13.6	5.027
14	5	20	22.60	2.2508	23	29	11.4	4.901
15	5	22	37.65	2.2510	23	34	1.7	4.775
16	5	24	52.72	2.2512	23	38	44.4	4.647
17	5	27	7.80	2.2513	23	43	19.4	4.519
18	5	29	22.88	2.2514	23	47	46.7	4.392
19	5	31	37.97	2.2515	23	52	6.4	4.265
20	5	33	53.06	2.2514	23	56	18.5	4.138
21	5	36	8.14	2.2513	24	0	23.0	4.011
22	5	38	23.22	2.2512	24	4	19.8	3.884
23	5	40	38.29	2.2511	N.24	8	9.0	3.757

SATURDAY 4.

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.
0	5	42	53.35	2.2509	N.24	11	50.6	3.629
1	5	45	8.40	2.2507	24	15	24.5	3.501
2	5	47	23.43	2.2504	24	18	50.7	3.373
3	5	49	38.44	2.2500	24	22	9.2	3.245
4	5	51	53.43	2.2497	24	25	20.1	3.117
5	5	54	8.40	2.2493	24	28	23.3	2.989
6	5	56	23.34	2.2488	24	31	18.8	2.862
7	5	58	38.25	2.2482	24	34	6.7	2.734
8	6	0	53.12	2.2476	24	36	46.9	2.607
9	6	3	7.96	2.2470	24	39	19.5	2.479
10	6	5	22.76	2.2463	24	41	44.4	2.352
11	6	7	37.52	2.2456	24	44	1.7	2.224
12	6	9	52.23	2.2448	24	46	11.3	2.097
13	6	12	6.89	2.2439	24	48	13.3	1.969
14	6	14	21.50	2.2431	24	50	7.6	1.842
15	6	16	36.06	2.2422	24	51	54.3	1.715
16	6	18	50.56	2.2411	24	53	33.4	1.588
17	6	21	4.99	2.2400	24	55	4.9	1.462
18	6	23	19.36	2.2389	24	56	28.8	1.335
19	6	25	33.66	2.2378	24	57	45.1	1.208
20	6	27	47.89	2.2366	24	58	53.8	1.082
21	6	30	2.05	2.2353	24	59	54.9	0.956
22	6	32	16.13	2.2341	25	0	48.5	0.830
23	6	34	30.14	2.2328	25	1	34.5	0.704
24	6	36	44.07	2.2314	N.25	2	13.0	0.579

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 5.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	6 36 44.07	2.2314	N.25 2 13.0	0.579
1	6 38 57.91	2.2299	25 2 44.0	0.454
2	6 41 11.66	2.2284	25 3 7.5	0.328
3	6 43 25.32	2.2268	25 3 23.4	0.203
4	6 45 38.88	2.2252	25 3 31.9	+ 0.079
5	6 47 52.35	2.2236	25 3 32.9	− 0.046
6	6 50 5.72	2.2220	25 3 26.4	0.170
7	6 52 18.99	2.2202	25 3 12.5	0.293
8	6 54 32.15	2.2184	25 2 51.2	0.416
9	6 56 45.20	2.2166	25 2 22.6	0.539
10	6 58 58.14	2.2147	25 1 46.6	0.662
11	7 1 10.97	2.2129	25 1 3.2	0.785
12	7 3 23.69	2.2110	25 0 12.4	0.907
13	7 5 36.29	2.2089	24 59 14.3	1.029
14	7 7 48.76	2.2068	24 58 8.9	1.150
15	7 10 1.10	2.2047	24 56 56.3	1.271
16	7 12 13.32	2.2026	24 55 26.4	1.392
17	7 14 25.41	2.2004	24 54 9.3	1.512
18	7 16 37.37	2.1982	24 52 35.0	1.632
19	7 18 49.19	2.1959	24 50 53.5	1.752
20	7 21 0.88	2.1936	24 49 4.8	1.871
21	7 23 12.43	2.1912	24 47 9.0	1.990
22	7 25 23.83	2.1888	24 45 6.0	2.108
23	7 27 35.09	2.1865	N.24 42 56.0	2.226

MONDAY 6.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	7 29 46.21	2.1841	N.24 40 38.9	2.343
1	7 31 57.18	2.1815	24 38 14.8	2.460
2	7 34 7.99	2.1789	24 35 43.7	2.577
3	7 36 18.65	2.1763	24 33 5.5	2.694
4	7 38 29.15	2.1737	24 30 20.4	2.809
5	7 40 39.50	2.1711	24 27 28.4	2.924
6	7 42 49.69	2.1685	24 24 29.5	3.039
7	7 44 59.72	2.1658	24 21 23.7	3.153
8	7 47 9.58	2.1630	24 18 11.1	3.267
9	7 49 19.28	2.1602	24 14 51.6	3.381
10	7 51 28.81	2.1575	24 11 25.4	3.494
11	7 53 38.18	2.1547	24 7 52.4	3.606
12	7 55 47.38	2.1518	24 4 12.7	3.718
13	7 57 56.40	2.1489	24 0 26.3	3.829
14	8 0 5.25	2.1461	23 56 33.2	3.940
15	8 2 13.93	2.1432	23 52 33.5	4.050
16	8 4 22.43	2.1402	23 48 27.2	4.160
17	8 6 30.75	2.1373	23 44 14.3	4.269
18	8 8 38.90	2.1343	23 39 54.9	4.377
19	8 10 46.87	2.1312	23 35 29.0	4.486
20	8 12 54.65	2.1282	23 30 56.6	4.594
21	8 15 2.25	2.1252	23 26 17.7	4.701
22	8 17 9.67	2.1221	23 21 32.4	4.807
23	8 19 16.90	2.1190	23 16 40.8	4.913
24	8 21 23.95	2.1159	N.23 11 42.8	5.019

TUESDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	8 21 23.95	2.1159	N.23 11 42.8	5.019
1	8 23 30.81	2.1127	23 6 38.5	5.123
2	8 25 37.48	2.1096	23 1 28.0	5.227
3	8 27 43.96	2.1065	22 56 11.2	5.331
4	8 29 50.26	2.1034	22 50 48.2	5.435
5	8 31 56.37	2.1003	22 45 19.0	5.537
6	8 34 2.29	2.0971	22 39 43.7	5.639
7	8 36 8.02	2.0938	22 34 2.3	5.741
8	8 38 13.55	2.0906	22 28 14.8	5.842
9	8 40 18.89	2.0874	22 22 21.3	5.942
10	8 42 24.04	2.0842	22 16 21.8	6.041
11	8 44 29.00	2.0811	22 10 16.4	6.140
12	8 46 33.77	2.0778	22 4 5.0	6.239
13	8 48 38.34	2.0746	21 57 47.7	6.337
14	8 50 42.72	2.0714	21 51 24.6	6.434
15	8 52 46.91	2.0682	21 44 55.7	6.530
16	8 54 50.90	2.0649	21 38 21.0	6.626
17	8 56 54.70	2.0617	21 31 40.6	6.721
18	8 58 58.30	2.0584	21 24 54.5	6.816
19	9 1 1.71	2.0552	21 18 2.7	6.910
20	9 3 4.93	2.0520	21 11 5.3	7.003
21	9 5 7.95	2.0488	21 4 2.3	7.096
22	9 7 10.78	2.0456	20 56 53.8	7.188
23	9 9 13.42	2.0423	N.20 49 39.8	7.280

WEDNESDAY 8.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	9 11 15.86	2.0391	N.20 42 20.2	7.372
1	9 13 18.11	2.0359	20 34 55.2	7.462
2	9 15 20.17	2.0327	20 27 24.8	7.551
3	9 17 22.04	2.0296	20 19 49.1	7.639
4	9 19 23.72	2.0265	20 12 8.1	7.728
5	9 21 25.22	2.0234	20 4 21.8	7.816
6	9 23 26.53	2.0202	19 56 30.2	7.903
7	9 25 27.65	2.0171	19 48 33.4	7.989
8	9 27 28.58	2.0139	19 40 31.5	8.075
9	9 29 29.32	2.0108	19 32 24.4	8.161
10	9 31 29.88	2.0077	19 24 12.2	8.245
11	9 33 30.25	2.0047	19 15 55.0	8.328
12	9 35 30.44	2.0017	19 7 32.8	8.412
13	9 37 30.45	1.9987	18 59 5.6	8.494
14	9 39 30.28	1.9956	18 50 33.5	8.576
15	9 41 29.92	1.9925	18 41 56.5	8.658
16	9 43 29.38	1.9896	18 33 14.6	8.739
17	9 45 28.67	1.9867	18 24 27.8	8.820
18	9 47 27.78	1.9837	18 15 36.2	8.899
19	9 49 26.72	1.9808	18 6 39.9	8.977
20	9 51 25.48	1.9779	17 57 39.0	9.054
21	9 53 24.07	1.9751	17 48 33.4	9.131
22	9 55 22.49	1.9723	17 39 23.2	9.208
23	9 57 20.74	1.9695	17 30 8.4	9.285
24	9 59 18.83	1.9667	N.17 20 49.0	9.361

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 9.					SATURDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	9 59 18.83	1.9667	N.17 20 49.0	9.361	0	11 31 8.74	1.8751	N. 8 37 27.6	12.182
1	10 1 16.75	1.9639	17 11 25.1	9.435	1	11 33 1.22	1.8742	8 25 15.4	12.223
2	10 3 14.50	1.9612	17 1 56.8	9.508	2	11 34 53.65	1.8734	8 13 0.8	12.264
3	10 5 12.09	1.9585	16 52 24.1	9.582	3	11 36 46.03	1.8727	8 0 43.7	12.305
4	10 7 9.52	1.9558	16 42 47.0	9.655	4	11 38 38.37	1.8720	7 48 24.2	12.344
5	10 9 6.79	1.9532	16 33 5.5	9.727	5	11 40 30.67	1.8714	7 36 2.4	12.383
6	10 11 3.90	1.9506	16 23 19.7	9.798	6	11 42 22.94	1.8708	7 23 38.3	12.421
7	10 13 0.86	1.9480	16 13 29.7	9.869	7	11 44 15.17	1.8702	7 11 11.9	12.458
8	10 14 57.66	1.9454	16 3 35.4	9.940	8	11 46 7.37	1.8698	6 58 43.3	12.495
9	10 16 54.31	1.9429	15 53 36.9	10.009	9	11 47 59.55	1.8694	6 46 12.5	12.531
10	10 18 50.81	1.9404	15 43 34.3	10.078	10	11 49 51.70	1.8690	6 33 39.6	12.565
11	10 20 47.16	1.9379	15 33 27.6	10.146	11	11 51 43.83	1.8687	6 21 4.7	12.598
12	10 22 43.36	1.9355	15 23 16.8	10.213	12	11 53 35.94	1.8684	6 8 27.8	12.632
13	10 24 39.42	1.9332	15 13 2.0	10.280	13	11 55 28.04	1.8682	5 55 48.9	12.665
14	10 26 35.34	1.9308	15 2 43.2	10.346	14	11 57 20.13	1.8681	5 43 8.0	12.697
15	10 28 31.12	1.9285	14 52 20.5	10.411	15	11 59 12.21	1.8679	5 30 25.2	12.729
16	10 30 26.76	1.9262	14 41 53.9	10.476	16	12 1 4.28	1.8678	5 17 40.5	12.759
17	10 32 22.26	1.9239	14 31 23.4	10.540	17	12 2 56.35	1.8679	5 4 54.1	12.788
18	10 34 17.63	1.9217	14 20 49.1	10.603	18	12 4 48.43	1.8680	4 52 5.9	12.817
19	10 36 12.87	1.9196	14 10 11.0	10.666	19	12 6 40.51	1.8681	4 39 16.0	12.846
20	10 38 7.98	1.9174	13 59 29.2	10.728	20	12 8 32.60	1.8682	4 26 24.4	12.873
21	10 40 2.96	1.9153	13 48 43.7	10.789	21	12 10 24.70	1.8684	4 13 31.2	12.900
22	10 41 57.82	1.9133	13 37 54.5	10.850	22	12 12 16.81	1.8687	4 0 36.4	12.925
23	10 43 52.56	1.9113	N.13 27 1.7	10.910	23	12 14 8.94	1.8691	N. 3 47 40.2	12.949
	FRIDAY 10.					SUNDAY 12.			
0	10 45 47.17	1.9093	N.13 16 5.3	10.969	0	12 16 1.10	1.8695	N. 3 34 42.5	12.973
1	10 47 41.67	1.9074	13 5 5.4	11.027	1	12 17 53.28	1.8699	3 21 43.4	12.997
2	10 49 36.06	1.9055	12 54 2.0	11.085	2	12 19 45.49	1.8704	3 8 42.9	13.020
3	10 51 30.33	1.9036	12 42 55.2	11.142	3	12 21 37.73	1.8709	2 55 41.0	13.042
4	10 53 24.49	1.9018	12 31 44.9	11.199	4	12 23 30.00	1.8715	2 42 37.8	13.063
5	10 55 18.54	1.9000	12 20 31.3	11.255	5	12 25 22.31	1.8722	2 29 33.4	13.083
6	10 57 12.49	1.8983	12 9 14.3	11.311	6	12 27 14.67	1.8730	2 16 27.9	13.102
7	10 59 6.33	1.8966	11 57 54.0	11.365	7	12 29 7.07	1.8738	2 3 21.2	13.121
8	11 1 0.08	1.8950	11 46 30.5	11.419	8	12 30 59.52	1.8746	1 50 13.4	13.138
9	11 2 53.73	1.8934	11 35 3.8	11.472	9	12 32 52.02	1.8755	1 37 4.6	13.154
10	11 4 47.29	1.8919	11 23 33.9	11.524	10	12 34 44.58	1.8765	1 23 54.9	13.169
11	11 6 40.76	1.8903	11 12 0.9	11.575	11	12 36 37.20	1.8774	1 10 44.3	13.184
12	11 8 34.13	1.8888	11 0 24.9	11.625	12	12 38 29.87	1.8784	0 57 32.8	13.198
13	11 10 27.42	1.8875	10 48 45.9	11.676	13	12 40 22.61	1.8796	0 44 20.5	13.212
14	11 12 20.63	1.8862	10 37 3.8	11.727	14	12 42 15.42	1.8808	0 31 7.4	13.225
15	11 14 13.76	1.8848	10 25 18.7	11.776	15	12 44 8.31	1.8821	0 17 53.5	13.237
16	11 16 6.81	1.8835	10 13 30.7	11.823	16	12 46 1.27	1.8834	N. 0 4 38.9	13.248
17	11 17 59.78	1.8822	10 1 39.9	11.870	17	12 47 54.32	1.8848	S. 0 8 36.3	13.257
18	11 19 52.68	1.8811	9 49 46.3	11.917	18	12 49 47.45	1.8862	0 21 52.0	13.266
19	11 21 45.51	1.8800	9 37 49.9	11.963	19	12 51 40.67	1.8877	0 35 8.2	13.274
20	11 23 38.28	1.8789	9 25 50.8	12.008	20	12 53 33.98	1.8892	0 48 24.9	13.282
21	11 25 30.98	1.8778	9 13 48.9	12.053	21	12 55 27.38	1.8908	1 1 42.0	13.288
22	11 27 23.62	1.8769	9 1 44.4	12.097	22	12 57 20.88	1.8925	1 14 59.4	13.293
23	11 29 16.21	1.8760	8 49 37.3	12.140	23	12 59 14.48	1.8942	1 28 17.1	13.298
24	11 31 8.74	1.8751	N. 8 37 27.6	12.182	24	13 1 8.18	1.8959	S. 1 41 35.1	13.301

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 13.					**WEDNESDAY 15.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	13 1 8.18	1.8959	S. 1 41 35.1	13.301	0	14 35 18.86	2.0501	S. 12 5 31.3	12.291
1	13 3 1.99	1.8978	1 54 53.2	13.304	1	14 37 22.00	2.0547	12 17 47.3	12.242
2	13 4 55.92	1.8997	2 8 11.5	13.306	2	14 39 25.42	2.0593	12 30 0.4	12.192
3	13 6 49.96	1.9017	2 21 29.9	13.307	3	14 41 29.12	2.0640	12 42 10.4	12.142
4	13 8 44.12	1.9037	2 34 48.3	13.307	4	14 43 33.10	2.0687	12 54 17.4	12.091
5	13 10 38.40	1.9058	2 48 6.7	13.306	5	14 45 37.36	2.0734	13 6 21.3	12.038
6	13 12 32.81	1.9079	3 1 25.0	13.303	6	14 47 41.91	2.0782	13 18 21.9	11.983
7	13 14 27.35	1.9101	3 14 43.1	13.300	7	14 49 46.75	2.0831	13 30 19.2	11.928
8	13 16 22.02	1.9123	3 28 1.0	13.296	8	14 51 51.88	2.0879	13 42 13.2	11.871
9	13 18 16.83	1.9147	3 41 18.6	13.291	9	14 53 57.30	2.0928	13 54 3.7	11.812
10	13 20 11.79	1.9171	3 54 35.9	13.286	10	14 56 3.02	2.0978	14 5 50.7	11.753
11	13 22 6.89	1.9195	4 7 52.9	13.279	11	14 58 9.04	2.1029	14 17 34.1	11.693
12	13 24 2.13	1.9220	4 21 9.4	13.271	12	15 0 15.37	2.1080	14 29 13.9	11.632
13	13 25 57.53	1.9246	4 34 25.4	13.262	13	15 2 22.00	2.1131	14 40 49.9	11.568
14	13 27 53.08	1.9272	4 47 40.9	13.253	14	15 4 28.94	2.1182	14 52 22.1	11.504
15	13 29 48.79	1.9298	5 0 55.8	13.242	15	15 6 36.18	2.1234	15 3 50.4	11.439
16	13 31 44.66	1.9326	5 14 10.0	13.230	16	15 8 43.74	2.1286	15 15 14.8	11.372
17	13 33 40.70	1.9354	5 27 23.4	13.217	17	15 10 51.61	2.1338	15 26 35.1	11.303
18	13 35 36.90	1.9382	5 40 36.0	13.203	18	15 12 59.79	2.1390	15 37 51.2	11.233
19	13 37 33.28	1.9412	5 53 47.8	13.189	19	15 15 8.29	2.1444	15 49 3.1	11.163
20	13 39 29.84	1.9441	6 6 58.7	13.173	20	15 17 17.12	2.1498	16 0 10.8	11.092
21	13 41 26.57	1.9470	6 20 8.6	13.157	21	15 19 26.27	2.1552	16 11 14.1	11.018
22	13 43 23.48	1.9501	6 33 17.5	13.139	22	15 21 35.74	2.1606	16 22 12.9	10.943
23	13 45 20.58	1.9533	S. 6 46 25.3	13.120	23	15 23 45.54	2.1660	S. 16 33 7.3	10.868
	TUESDAY 14.					**THURSDAY 16.**			
0	13 47 17.88	1.9566	S. 6 59 31.9	13.100	0	15 25 55.66	2.1714	S. 16 43 57.1	10.791
1	13 49 15.37	1.9598	7 12 37.3	13.079	1	15 28 6.11	2.1769	16 54 42.2	10.712
2	13 51 13.06	1.9631	7 25 41.4	13.057	2	15 30 16.89	2.1825	17 5 22.6	10.632
3	13 53 10.94	1.9664	7 38 44.1	13.033	3	15 32 28.01	2.1881	17 15 58.1	10.551
4	13 55 9.03	1.9699	7 51 45.4	13.009	4	15 34 39.46	2.1936	17 26 28.7	10.468
5	13 57 7.33	1.9733	8 4 45.2	12.984	5	15 36 51.24	2.1992	17 36 54.3	10.385
6	13 59 5.83	1.9768	8 17 43.5	12.958	6	15 39 3.36	2.2048	17 47 14.9	10.300
7	14 1 4.55	1.9805	8 30 40.2	12.931	7	15 41 15.82	2.2105	17 57 30.3	10.213
8	14 3 3.49	1.9842	8 43 35.2	12.902	8	15 43 28.62	2.2161	18 7 40.5	10.126
9	14 5 2.65	1.9879	8 56 28.4	12.872	9	15 45 41.75	2.2217	18 17 45.4	10.037
10	14 7 2.04	1.9917	9 9 19.8	12.842	10	15 47 55.22	2.2274	18 27 44.9	9.946
11	14 9 1.66	1.9955	9 22 9.4	12.810	11	15 50 9.04	2.2332	18 37 38.9	9.854
12	14 11 1.50	1.9993	9 34 57.0	12.777	12	15 52 23.20	2.2389	18 47 27.4	9.762
13	14 13 1.58	2.0033	9 47 42.6	12.743	13	15 54 37.70	2.2445	18 57 10.3	9.668
14	14 15 1.90	2.0073	10 0 26.1	12.708	14	15 56 52.54	2.2502	19 6 47.5	9.571
15	14 17 2.46	2.0113	10 13 7.5	12.672	15	15 59 7.73	2.2560	19 16 18.8	9.474
16	14 19 3.26	2.0154	10 25 46.7	12.633	16	16 1 23.26	2.2617	19 25 44.3	9.376
17	14 21 4.31	2.0196	10 38 23.5	12.593	17	16 3 39.14	2.2675	19 35 3.9	9.277
18	14 23 5.61	2.0238	10 50 57.9	12.553	18	16 5 55.36	2.2732	19 44 17.5	9.176
19	14 25 7.17	2.0281	11 3 29.9	12.513	19	16 8 11.92	2.2789	19 53 25.0	9.073
20	14 27 8.98	2.0324	11 15 59.5	12.472	20	16 10 28.83	2.2847	20 2 26.3	8.969
21	14 29 11.05	2.0368	11 28 26.5	12.428	21	16 12 46.08	2.2904	20 11 21.3	8.864
22	14 31 13.39	2.0412	11 40 50.8	12.383	22	16 15 3.67	2.2961	20 20 10.0	8.758
23	14 33 15.99	2.0456	11 53 12.4	12.338	23	16 17 21.61	2.3018	20 28 52.3	8.651
24	14 35 18.86	2.0501	S. 12 5 31.3	12.291	24	16 19 39.89	2.3075	S. 20 37 28.1	8.542

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 17.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	16 19 39.89	2.3075	S.20 37 28.1	8.542
1	16 21 58.51	2.3132	20 45 57.3	8.432
2	16 24 17.47	2.3189	20 54 19.9	8.320
3	16 26 36.78	2.3246	21 2 35.7	8.207
4	16 28 56.43	2.3302	21 10 44.7	8.093
5	16 31 16.41	2.3357	21 18 46.9	7.979
6	16 33 36.72	2.3413	21 26 42.2	7.862
7	16 35 57.37	2.3469	21 34 30.4	7.744
8	16 38 18.35	2.3525	21 42 11.5	7.625
9	16 40 39.67	2.3581	21 49 45.4	7.505
10	16 43 1.32	2.3635	21 57 12.1	7.383
11	16 45 23.29	2.3689	22 4 31.4	7.260
12	16 47 45.59	2.3743	22 11 43.3	7.136
13	16 50 8.21	2.3797	22 18 47.7	7.011
14	16 52 31.16	2.3851	22 25 44.6	6.885
15	16 54 54.43	2.3904	22 32 33.9	6.757
16	16 57 18.01	2.3957	22 39 15.5	6.628
17	16 59 41.91	2.4009	22 45 49.3	6.497
18	17 2 6.12	2.4061	22 52 15.2	6.366
19	17 4 30.64	2.4112	22 58 33.2	6.234
20	17 6 55.46	2.4162	23 4 43.3	6.101
21	17 9 20.59	2.4212	23 10 45.3	5.966
22	17 11 46.01	2.4262	23 16 39.2	5.830
23	17 14 11.73	2.4311	S.23 22 24.9	5.693

SATURDAY 18.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	17 16 37.74	2.4359	S.23 28 2.4	5.556
1	17 19 4.04	2.4406	23 33 31.6	5.417
2	17 21 30.62	2.4453	23 38 52.4	5.276
3	17 23 57.48	2.4500	23 44 4.7	5.135
4	17 26 24.62	2.4546	23 49 8.6	4.993
5	17 28 52.03	2.4591	23 54 3.9	4.850
6	17 31 19.71	2.4635	23 58 50.6	4.706
7	17 33 47.65	2.4678	24 3 28.6	4.561
8	17 36 15.85	2.4721	24 7 57.9	4.415
9	17 38 44.30	2.4763	24 12 18.1	4.267
10	17 41 13.00	2.4804	24 16 30.0	4.119
11	17 43 41.95	2.4844	24 20 32.7	3.970
12	17 46 11.13	2.4883	24 24 26.4	3.820
13	17 48 40.55	2.4922	24 28 11.1	3.670
14	17 51 10.19	2.4959	24 31 46.8	3.519
15	17 53 40.06	2.4996	24 35 13.4	3.367
16	17 56 10.15	2.5032	24 38 30.8	3.214
17	17 58 40.44	2.5066	24 41 39.0	3.060
18	18 1 10.94	2.5100	24 44 38.0	2.906
19	18 3 41.64	2.5133	24 47 27.7	2.750
20	18 6 12.54	2.5165	24 50 8.0	2.593
21	18 8 43.62	2.5195	24 52 38.9	2.436
22	18 11 14.88	2.5225	24 55 0.4	2.279
23	18 13 46.32	2.5254	24 57 12.4	2.121
24	18 16 17.93	2.5282	S.24 59 14.9	1.962

SUNDAY 19.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	18 16 17.93	2.5282	S.24 59 14.9	1.962
1	18 18 49.70	2.5308	25 1 7.9	1.803
2	18 21 21.63	2.5334	25 2 51.3	1.643
3	18 23 53.71	2.5359	25 4 25.1	1.483
4	18 26 25.94	2.5382	25 5 49.3	1.322
5	18 28 58.30	2.5404	25 7 3.8	1.161
6	18 31 30.79	2.5426	25 8 8.6	0.999
7	18 34 3.41	2.5446	25 9 3.7	0.837
8	18 36 36.14	2.5464	25 9 49.0	0.674
9	18 39 8.98	2.5482	25 10 24.6	0.511
10	18 41 41.93	2.5499	25 10 50.4	0.347
11	18 44 14.97	2.5514	25 11 6.3	0.183
12	18 46 48.10	2.5529	25 11 12.4	− 0.020
13	18 49 21.32	2.5542	25 11 8.7	+ 0.144
14	18 51 54.61	2.5553	25 10 55.1	0.309
15	18 54 27.96	2.5563	25 10 31.6	0.474
16	18 57 1.37	2.5573	25 9 58.2	0.639
17	18 59 34.84	2.5582	25 9 14.9	0.803
18	19 2 8.36	2.5589	25 8 21.8	0.968
19	19 4 41.91	2.5595	25 7 18.7	1.134
20	19 7 15.50	2.5601	25 6 5.7	1.299
21	19 9 49.12	2.5606	25 4 42.8	1.464
22	19 12 22.76	2.5607	25 3 10.0	1.630
23	19 14 56.40	2.5608	S.25 1 27.2	1.796

MONDAY 20.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	19 17 30.05	2.5609	S.24 59 34.5	1.961
1	19 20 3.70	2.5608	24 57 31.9	2.126
2	19 22 37.34	2.5606	24 55 19.4	2.292
3	19 25 10.96	2.5602	24 52 56.9	2.457
4	19 27 44.56	2.5597	24 50 24.6	2.621
5	19 30 18.13	2.5592	24 47 42.4	2.786
6	19 32 51.67	2.5586	24 44 50.3	2.950
7	19 35 25.16	2.5578	24 41 48.4	3.114
8	19 37 58.60	2.5569	24 38 36.6	3.278
9	19 40 31.99	2.5559	24 35 15.0	3.442
10	19 43 5.31	2.5547	24 31 43.6	3.605
11	19 45 38.56	2.5535	24 28 2.4	3.768
12	19 48 11.73	2.5522	24 24 11.4	3.931
13	19 50 44.82	2.5508	24 20 10.7	4.093
14	19 53 17.82	2.5493	24 16 0.3	4.254
15	19 55 50.73	2.5477	24 11 40.1	4.417
16	19 58 23.54	2.5459	24 7 10.3	4.577
17	20 0 56.24	2.5440	24 2 30.9	4.737
18	20 3 28.82	2.5421	23 57 41.9	4.896
19	20 6 1.29	2.5401	23 52 43.4	5.055
20	20 8 33.63	2.5379	23 47 35.3	5.214
21	20 11 5.84	2.5357	23 42 17.7	5.372
22	20 13 37.92	2.5334	23 36 50.6	5.529
23	20 16 9.85	2.5309	23 31 14.2	5.685
24	20 18 41.63	2.5284	S.23 25 28.4	5.841

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 21.					**THURSDAY 23.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	20 18 41.63	2.5284	S. 23 25 28.4	5.841	0	22 16 2.10	2.3477	S. 16 4 8.6	12.092
1	20 21 13.26	2.5258	23 19 33.3	5.996	1	22 18 22.84	2.3436	15 52 0.1	12.190
2	20 23 44.73	2.5232	23 13 28.9	6.150	2	22 20 43.33	2.3394	15 39 45.8	12.287
3	20 26 16.05	2.5206	23 7 15.3	6.304	3	22 23 3.57	2.3353	15 27 25.7	12.383
4	20 28 47.20	2.5177	23 0 52.5	6.457	4	22 25 23.56	2.3312	15 14 59.9	12.477
5	20 31 18.17	2.5148	22 54 20.5	6.609	5	22 27 43.31	2.3271	15 2 28.5	12.569
6	20 33 48.97	2.5118	22 47 39.4	6.760	6	22 30 2.81	2.3230	14 49 51.6	12.660
7	20 36 19.59	2.5087	22 40 49.3	6.909	7	22 32 22.07	2.3190	14 37 9.3	12.749
8	20 38 50.02	2.5056	22 33 50.3	7.058	8	22 34 41.09	2.3150	14 24 21.7	12.837
9	20 41 20.26	2.5024	22 26 42.3	7.207	9	22 36 59.87	2.3110	14 11 28.8	12.924
10	20 43 50.31	2.4992	22 19 25.4	7.355	10	22 39 18.41	2.3071	13 58 30.8	13.009
11	20 46 20.16	2.4959	22 11 59.7	7.501	11	22 41 36.72	2.3032	13 45 27.7	13.092
12	20 48 49.82	2.4926	22 4 25.3	7.646	12	22 43 54.79	2.2993	13 32 19.7	13.174
13	20 51 19.27	2.4891	21 56 42.2	7.790	13	22 46 12.63	2.2954	13 19 6.8	13.254
14	20 53 48.51	2.4856	21 48 50.5	7.934	14	22 48 30.24	2.2916	13 5 49.2	13.332
15	20 56 17.54	2.4820	21 40 50.1	8.077	15	22 50 47.62	2.2878	12 52 26.9	13.410
16	20 58 46.35	2.4783	21 32 41.2	8.218	16	22 53 4.77	2.2840	12 39 0.0	13.486
17	21 1 14.94	2.4747	21 24 23.9	8.358	17	22 55 21.70	2.2802	12 25 28.6	13.560
18	21 3 43.32	2.4711	21 15 58.2	8.497	18	22 57 38.41	2.2766	12 11 52.8	13.632
19	21 6 11.47	2.4673	21 7 24.2	8.636	19	22 59 54.90	2.2730	11 58 12.7	13.703
20	21 8 39.39	2.4634	20 58 41.9	8.773	20	23 2 11.17	2.2694	11 44 28.4	13.773
21	21 11 7.08	2.4596	20 49 51.4	8.909	21	23 4 27.22	2.2658	11 30 39.9	13.842
22	21 13 34.54	2.4557	20 40 52.8	9.043	22	23 6 43.06	2.2623	11 16 47.4	13.908
23	21 16 1.77	2.4518	S. 20 31 46.2	9.177	23	23 8 58.70	2.2589	S. 11 2 51.0	13.972
	WEDNESDAY 22.					**FRIDAY 24.**			
0	21 18 28.76	2.4478	S. 20 22 31.6	9.310	0	23 11 14.13	2.2556	S. 10 48 50.8	14.035
1	21 20 55.51	2.4438	20 13 9.0	9.440	1	23 13 29.36	2.2522	10 34 46.8	14.097
2	21 23 22.02	2.4398	20 3 38.7	9.569	2	23 15 44.39	2.2488	10 20 39.2	14.157
3	21 25 48.29	2.4358	19 54 0.7	9.698	3	23 17 59.21	2.2454	10 6 28.0	14.215
4	21 28 14.31	2.4317	19 44 15.0	9.826	4	23 20 13.84	2.2422	9 52 13.4	14.272
5	21 30 40.09	2.4276	19 34 21.6	9.952	5	23 22 28.28	2.2391	9 37 55.4	14.328
6	21 33 5.62	2.4234	19 24 20.7	10.077	6	23 24 42.53	2.2360	9 23 34.1	14.382
7	21 35 30.90	2.4193	19 14 12.3	10.201	7	23 26 56.60	2.2329	9 9 9.6	14.433
8	21 37 55.93	2.4152	19 3 56.6	10.322	8	23 29 10.48	2.2298	8 54 42.1	14.483
9	21 40 20.72	2.4111	18 53 33.6	10.443	9	23 31 24.18	2.2269	8 40 11.6	14.532
10	21 42 45.26	2.4068	18 43 3.4	10.563	10	23 33 37.71	2.2241	8 25 38.2	14.580
11	21 45 9.54	2.4025	18 32 26.0	10.682	11	23 35 51.07	2.2212	8 11 2.0	14.626
12	21 47 33.56	2.3983	18 21 41.6	10.798	12	23 38 4.25	2.2183	7 56 23.1	14.670
13	21 49 57.33	2.3941	18 10 50.2	10.914	13	23 40 17.26	2.2156	7 41 41.6	14.712
14	21 52 20.85	2.3899	17 59 51.9	11.028	14	23 42 30.12	2.2130	7 26 57.6	14.754
15	21 54 44.12	2.3857	17 48 46.8	11.141	15	23 44 42.82	2.2103	7 12 11.1	14.794
16	21 57 7.13	2.3814	17 37 35.0	11.252	16	23 46 55.36	2.2077	6 57 22.3	14.832
17	21 59 29.89	2.3772	17 26 16.5	11.362	17	23 49 7.74	2.2051	6 42 31.3	14.868
18	22 1 52.39	2.3729	17 14 51.5	11.471	18	23 51 19.97	2.2027	6 27 38.2	14.903
19	22 4 14.64	2.3687	17 3 20.0	11.578	19	23 53 32.06	2.2003	6 12 43.0	14.936
20	22 6 36.64	2.3645	16 51 42.1	11.683	20	23 55 44.01	2.1980	5 57 45.9	14.967
21	22 8 58.38	2.3603	16 39 58.0	11.787	21	23 57 55.82	2.1957	5 42 47.0	14.997
22	22 11 19.87	2.3561	16 28 7.7	11.890	22	0 0 7.49	2.1934	5 27 46.3	15.026
23	22 13 41.11	2.3519	16 16 11.2	11.992	23	0 2 19.02	2.1911	5 12 43.9	15.053
24	22 16 2.10	2.3477	S. 16 4 8.6	12.092	24	0 4 30.42	2.1890	S. 4 57 40.0	15.078

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 25.					**MONDAY 27.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	0 4 30.42	2.1890	S. 4 57 40.0	15.078	0	1 48 18.21	2.1583	N. 7 5 46.2	14.488
1	0 6 41.70	2.1870	4 42 34.6	15.102	1	1 50 27.73	2.1590	7 20 14.0	14.439
2	0 8 52.86	2.1851	4 27 27.8	15.123	2	1 52 37.29	2.1598	7 34 38.9	14.390
3	0 11 3.91	2.1832	4 12 19.8	15.143	3	1 54 46.90	2.1606	7 49 0.8	14.339
4	0 13 14.84	2.1813	3 57 10.6	15.162	4	1 56 56.56	2.1614	8 3 19.6	14.287
5	0 15 25.66	2.1795	3 42 0.3	15.180	5	1 59 6.27	2.1623	8 17 35.2	14.232
6	0 17 36.38	2.1777	3 26 49.0	15.196	6	2 1 16.04	2.1633	8 31 47.5	14.177
7	0 19 46.99	2.1760	3 11 36.8	15.210	7	2 3 25.87	2.1643	8 45 56.4	14.121
8	0 21 57.50	2.1744	2 56 23.8	15.223	8	2 5 35.76	2.1653	9 0 2.0	14.064
9	0 24 7.92	2.1729	2 41 10.0	15.235	9	2 7 45.71	2.1664	9 14 4.1	14.005
10	0 26 18.25	2.1714	2 25 55.6	15.244	10	2 9 55.73	2.1676	9 28 2.6	13.944
11	0 28 28.49	2.1699	2 10 40.7	15.252	11	2 12 5.82	2.1687	9 41 57.4	13.882
12	0 30 38.64	2.1685	1 55 25.4	15.258	12	2 14 15.97	2.1698	9 55 48.5	13.819
13	0 32 48.71	2.1672	1 40 9.7	15.263	13	2 16 26.20	2.1711	10 9 35.7	13.754
14	0 34 58.70	2.1659	1 24 53.8	15.267	14	2 18 36.51	2.1724	10 23 19.0	13.689
15	0 37 8.62	2.1648	1 9 37.7	15.269	15	2 20 46.89	2.1737	10 36 58.4	13.622
16	0 39 18.47	2.1637	0 54 21.5	15.269	16	2 22 57.35	2.1750	10 50 33.7	13.554
17	0 41 28.26	2.1626	0 39 5.4	15.267	17	2 25 7.89	2.1764	11 4 4.9	13.485
18	0 43 37.98	2.1615	0 23 49.5	15.264	18	2 27 18.52	2.1779	11 17 31.9	13.414
19	0 45 47.64	2.1606	S. 0 8 33.8	15.260	19	2 29 29.24	2.1793	11 30 54.6	13.342
20	0 47 57.25	2.1597	N. 0 6 41.7	15.255	20	2 31 40.04	2.1807	11 44 13.0	13.269
21	0 50 6.81	2.1589	0 21 56.8	15.247	21	2 33 50.93	2.1822	11 57 26.9	13.194
22	0 52 16.32	2.1582	0 37 11.4	15.238	22	2 36 1.91	2.1838	12 10 36.3	13.118
23	0 54 25.79	2.1574	N. 0 52 25.4	15.227	23	2 38 12.99	2.1854	N. 12 23 41.1	13.042
	SUNDAY 26.					**TUESDAY 28.**			
0	0 56 35.21	2.1567	N. 1 7 38.7	15.216	0	2 40 24.16	2.1870	N. 12 36 41.3	12.964
1	0 58 44.60	2.1561	1 22 51.3	15.203	1	2 42 35.43	2.1886	12 49 36.8	12.885
2	1 0 53.95	2.1556	1 38 3.0	15.188	2	2 44 46.80	2.1902	13 2 27.5	12.803
3	1 3 3.27	2.1552	1 53 13.8	15.172	3	2 46 58.26	2.1918	13 15 13.2	12.721
4	1 5 12.57	2.1548	2 8 23.6	15.153	4	2 49 9.82	2.1936	13 27 54.0	12.639
5	1 7 21.85	2.1544	2 23 32.2	15.133	5	2 51 21.49	2.1954	13 40 29.9	12.556
6	1 9 31.10	2.1541	2 38 39.6	15.112	6	2 53 33.27	2.1972	13 53 0.7	12.470
7	1 11 40.34	2.1539	2 53 45.7	15.090	7	2 55 45.15	2.1989	14 5 26.3	12.383
8	1 13 49.57	2.1537	3 8 50.4	15.067	8	2 57 57.14	2.2007	14 17 46.7	12.296
9	1 15 58.79	2.1536	3 23 53.7	15.042	9	3 0 9.23	2.2024	14 30 1.9	12.208
10	1 18 8.00	2.1535	3 38 55.4	15.015	10	3 2 21.43	2.2042	14 42 11.7	12.118
11	1 20 17.21	2.1535	3 53 55.5	14.987	11	3 4 33.74	2.2061	14 54 16.1	12.027
12	1 22 26.42	2.1536	4 8 53.8	14.957	12	3 6 46.16	2.2079	15 6 15.0	11.935
13	1 24 35.64	2.1537	4 23 50.3	14.926	13	3 8 58.69	2.2097	15 18 8.3	11.842
14	1 26 44.86	2.1538	4 38 44.9	14.893	14	3 11 11.33	2.2116	15 29 56.1	11.749
15	1 28 54.09	2.1540	4 53 37.4	14.858	15	3 13 24.08	2.2135	15 41 38.2	11.654
16	1 31 3.34	2.1543	5 8 27.8	14.823	16	3 15 36.95	2.2154	15 53 14.6	11.558
17	1 33 12.61	2.1546	5 23 16.1	14.787	17	3 17 49.93	2.2173	16 4 45.2	11.461
18	1 35 21.89	2.1549	5 38 2.2	14.748	18	3 20 3.02	2.2192	16 16 9.9	11.363
19	1 37 31.19	2.1553	5 52 45.9	14.708	19	3 22 16.23	2.2211	16 27 28.7	11.264
20	1 39 40.53	2.1559	6 7 27.2	14.667	20	3 24 29.55	2.2229	16 38 41.6	11.164
21	1 41 49.90	2.1564	6 22 5.9	14.624	21	3 26 42.98	2.2248	16 49 48.4	11.063
22	1 43 59.30	2.1570	6 36 42.0	14.580	22	3 28 56.53	2.2267	17 0 49.1	10.961
23	1 46 8.74	2.1576	6 51 15.5	14.535	23	3 31 10.19	2.2287	17 11 43.7	10.858
24	1 48 18.21	2.1583	N. 7 5 46.2	14.488	24	3 33 23.97	2.2306	N. 17 22 32.1	10.754

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	3 33 23.97	2.2306	N.17 22 32.1	10.754
1	3 35 37.86	2.2325	17 33 14.2	10.649
2	3 37 51.87	2.2344	17 43 50.0	10.543
3	3 40 5.99	2.2363	17 54 19.4	10.437
4	3 42 20.22	2.2382	18 4 42.4	10.329
5	3 44 34.57	2.2401	18 14 58.9	10.221
6	3 46 49.03	2.2419	18 25 8.9	10.112
7	3 49 3.60	2.2438	18 35 12.3	10.002
8	3 51 18.28	2.2457	18 45 9.1	9.891
9	3 53 33.08	2.2476	18 54 59.2	9.778
10	3 55 47.99	2.2493	19 4 42.5	9.665
11	3 58 3.00	2.2510	19 14 19.0	9.552
12	4 0 18.11	2.2528	19 23 48.7	9.438
13	4 2 33.33	2.2546	19 33 11.5	9.323
14	4 4 48.66	2.2563	19 42 27.4	9.208
15	4 7 4.09	2.2581	19 51 36.4	9.092
16	4 9 19.63	2.2598	20 0 38.4	8.974
17	4 11 35.27	2.2614	20 9 33.3	8.856
18	4 13 51.00	2.2630	20 18 21.1	8.737
19	4 16 6.83	2.2647	20 27 1.8	8.618
20	4 18 22.76	2.2663	20 35 35.3	8.498
21	4 20 38.78	2.2678	20 44 1.5	8.377
22	4 22 54.90	2.2694	20 52 20.5	8.256
23	4 25 11.11	2.2709	N.21 0 32.2	8.134

THURSDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	4 27 27.40	2.2723	N.21 8 36.6	8.012
1	4 29 43.78	2.2738	21 16 33.7	7.889
2	4 32 0.25	2.2752	21 24 23.3	7.765
3	4 34 16.80	2.2765	21 32 5.5	7.641
4	4 36 33.43	2.2778	21 39 40.2	7.516
5	4 38 50.14	2.2791	21 47 7.4	7.391
6	4 41 6.92	2.2803	21 54 27.1	7.265
7	4 43 23.78	2.2815	22 1 39.2	7.139
8	4 45 40.70	2.2826	22 8 43.8	7.012
9	4 47 57.69	2.2837	22 15 40.7	6.884
10	4 50 14.75	2.2848	22 22 29.9	6.757
11	4 52 31.87	2.2858	22 29 11.5	6.629
12	4 54 49.05	2.2868	22 35 45.4	6.500
13	4 57 6.29	2.2877	22 42 11.5	6.371
14	4 59 23.58	2.2886	22 48 29.9	6.242
15	5 1 40.92	2.2894	22 54 40.6	6.113
16	5 3 58.31	2.2901	23 0 43.5	5.983
17	5 6 15.74	2.2908	23 6 38.5	5.852
18	5 8 33.21	2.2915	23 12 25.7	5.721
19	5 10 50.72	2.2921	23 18 5.0	5.590
20	5 13 8.26	2.2927	23 23 36.5	5.459
21	5 15 25.84	2.2932	23 29 0.1	5.327
22	5 17 43:45	2.2937	23 34 15.8	5.196
23	5 20 1.08	2.2940	23 39 23.6	5.064
24	5 22 18.73	2.2943	N.23 44 23.5	4.932

FRIDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	5 22 18.73	2.2943	N.23 44 23.5	4.932
1	5 24 36.40	2.2946	23 49 15.4	4.799
2	5 26 54.08	2.2948	23 53 59.4	4.667
3	5 29 11.78	2.2950	23 58 35.4	4.534
4	5 31 29.48	2.2950	24 3 3.4	4.401
5	5 33 47.18	2.2951	24 7 23.5	4.267
6	5 36 4.89	2.2951	24 11 35.5	4.134
7	5 38 22.59	2.2949	24 15 39.5	4.001
8	5 40 40.28	2.2948	24 19 35.6	3.868
9	5 42 57.97	2.2946	24 23 23.7	3.735
10	5 45 15.64	2.2943	24 27 3.8	3.601
11	5 47 33.29	2.2939	24 30 35.8	3.468
12	5 49 50.91	2.2934	24 33 59.9	3.335
13	5 52 8.50	2.2930	24 37 16.0	3.201
14	5 54 26.07	2.2926	24 40 24.0	3.067
15	5 56 43.61	2.2920	24 43 24.0	2.933
16	5 59 1.11	2.2913	24 46 16.0	2.800
17	6 1 18.56	2.2905	24 49 0.0	2.666
18	6 3 35.97	2.2897	24 51 35.9	2.532
19	6 5 53.33	2.2888	24 54 3.8	2.399
20	6 8 10.63	2.2879	24 56 23.8	2.266
21	6 10 27.88	2.2869	24 58 35.8	2.133
22	6 12 45.06	2.2858	25 0 39.8	2.000
23	6 15 2.18	2.2847	N.25 2 35.8	1.867

SATURDAY, NOVEMBER 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	6 17 19.23	2.2836	N.25 4 23.9	1.735

PHASES OF THE MOON.

		d	h	m
☾ Last Quarter . .	Oct.	5	8	23.3
● New Moon		13	11	5.0
☽ First Quarter		20	17	36.5
○ Full Moon		27	11	41.9

		d	h
☾ Apogee	Oct.	8	2.0
☾ Perigee		23	22.0

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L of Diff.	III^{h}.	P. L. of Diff.	VI^{h}.	P. L. of Diff.	IX^{h}.	P. L. of Diff.
1	Fomalhaut	W.	75° 7′ 17″	2667	76° 44′ 41″	2682	78° 21′ 46″	2697	79° 58′ 30″	2713
	α Pegasi	W.	58 36 38	3049	60 5 49	3049	61 35 2	3049	63 4 14	3051
	Pollux	E.	64 54 3	2490	63 12 36	2508	61 31 35	2526	59 50 58	2544
	Regulus	E.	100 58 28	2492	99 17 3	2510	97 36 2	2528	95 55 25	2545
2	Fomalhaut	W.	87 56 46	2796	89 31 19	2813	91 5 29	2831	92 39 17	2849
	α Pegasi	W.	70 29 4	3081	71 57 37	3090	73 26 0	3100	74 54 10	3110
	α Arietis	W.	26 57 16	3226	28 22 53	3183	29 49 23	3149	31 16 33	3123
	Pollux	E.	51 34 11	2636	49 56 5	2654	48 18 23	2672	46 41 5	2690
	Regulus	E.	87 38 27	2632	86 0 16	2650	84 22 30	2668	82 45 5	2685
	Sun	E.	128 32 41	2984	127 2 8	3001	125 31 57	3019	124 2 8	3037
3	Fomalhaut	W.	100 22 32	2938	101 54 3	2956	103 25 11	2974	104 55 56	2993
	α Pegasi	W.	82 11 38	3170	83 38 23	3183	85 4 51	3197	86 31 4	3211
	α Arietis	W.	38 38 25	3059	40 7 25	3055	41 36 30	3054	43 5 36	3055
	Pollux	E.	38 40 39	2780	37 5 45	2798	35 31 14	2815	33 57 6	2833
	Regulus	E.	74 43 47	2769	73 8 38	2786	71 33 50	2803	69 59 22	2819
	Sun	E.	116 38 29	3124	115 10 49	3141	113 43 29	3157	112 16 28	3173
4	α Pegasi	W.	93 37 53	3285	95 2 22	3300	96 26 34	3316	97 50 28	3331
	α Arietis	W.	50 30 37	3070	51 59 23	3075	53 28 3	3080	54 56 37	3086
	Aldebaran	W.	18 53 16	3001	20 23 28	3001	21 53 39	3002	23 23 49	3008
	Regulus	E.	62 12 2	2890	60 39 28	2903	59 7 13	2916	57 35 14	2929
	Sun	E.	105 6 10	3250	103 41 0	3264	102 16 6	3278	100 51 29	3292
5	α Arietis	W.	62 17 35	3117	63 45 24	3123	65 13 6	3129	66 40 41	3134
	Aldebaran	W.	30 54 7	3020	32 23 54	3025	33 53 34	3031	35 23 7	3037
	Regulus	E.	49 59 26	2989	48 29 0	3000	46 58 48	3011	45 28 49	3021
	Sun	E.	93 52 6	3351	92 28 54	3362	91 5 54	3373	89 43 7	3382
6	α Arietis	W.	73 56 54	3160	75 23 51	3165	76 50 42	3169	78 17 28	3173
	Aldebaran	W.	42 49 7	3065	44 18 0	3070	45 46 48	3074	47 15 30	3078
	Regulus	E.	38 1 57	3069	36 33 9	3078	35 4 31	3086	33 36 3	3094
	Sun	E.	82 51 43	3423	81 29 53	3430	80 8 11	3437	78 46 36	3443
7	α Arietis	W.	85 30 18	3188	86 56 42	3190	88 23 3	3191	89 49 23	3193
	Aldebaran	W.	54 37 58	3091	56 6 19	3093	57 34 37	3094	59 2 54	3095
	Sun	E.	72 0 6	3464	70 39 2	3467	69 18 0	3469	67 57 1	3471
8	Aldebaran	W.	66 24 12	3093	67 52 30	3091	69 20 50	3089	70 49 12	3087
	Pollux	W.	22 21 18	3139	23 48 40	3132	25 16 13	3125	26 43 56	3118
	Sun	E.	61 12 27	3473	59 51 33	3472	58 30 38	3471	57 9 41	3470
9	Aldebaran	W.	78 11 51	3071	79 40 36	3067	81 9 26	3062	82 38 22	3057
	Pollux	W.	34 4 22	3084	35 32 51	3077	37 1 27	3071	38 30 11	3065
	Sun	E.	50 24 22	3455	49 3 8	3452	47 41 50	3448	46 20 28	3444
10	Aldebaran	W.	90 4 40	3028	91 34 18	3022	93 4 3	3015	94 33 58	3008
	Pollux	W.	45 55 52	3031	47 25 26	3024	48 55 9	3017	50 25 1	3009
	Sun	E.	39 32 18	3419	38 10 23	3413	36 48 21	3408	35 26 14	3403
11	Aldebaran	W.	102 5 44	2970	103 36 34	2962	105 7 35	2954	106 38 45	2946

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Fomalhaut	W.	81° 34′ 53″	2729	83° 10′ 54″	2745	84° 46′ 33″	2762	86° 21′ 51″	2779
	α Pegasi	W.	64 33 24	3054	66 2 29	3059	67 31 29	3065	69 0 21	3073
	Pollux	E.	58 10 46	2563	56 31 0	2581	54 51 39	2599	53 12 42	2617
	Regulus	E.	94 15 12	2562	92 35 25	2580	90 56 1	2598	89 17 2	2615
2	Fomalhaut	W.	94 12 41	2867	95 45 42	2884	97 18 21	2901	98 50 38	2920
	α Pegasi	W.	76 22 8	3121	77 49 52	3132	79 17 22	3144	80 44 38	3158
	α Arietis	W.	32 44 15	3101	34 12 23	3085	35 40 51	3073	37 9 33	3065
	Pollux	E.	45 4 12	2708	43 27 43	2726	41 51 39	2744	40 15 57	2762
	Regulus	E.	81 8 4	2702	79 31 27	2719	77 55 11	2736	76 19 19	2753
	Sun	E.	122 32 41	3055	121 3 36	3071	119 34 53	3089	118 6 30	3107
3	Fomalhaut	W.	106 26 18	3011	107 56 19	3029	109 25 56	3047	110 55 11	3065
	α Pegasi	W.	87 57 0	3225	89 22 39	3240	90 48 1	3255	92 13 5	3269
	α Arietis	W.	44 34 41	3056	46 3 45	3057	47 32 47	3060	49 1 44	3065
	Pollux	E.	32 23 21	2852	30 50 0	2870	29 17 2	2887	27 44 26	2906
	Regulus	E.	68 25 17	2835	66 51 32	2849	65 18 5	2863	63 44 55	2877
	Sun	E.	110 49 47	3189	109 23 25	3205	107 57 22	3220	106 31 37	3235
4	α Pegasi	W.	99 14 4	3347	100 37 21	3362	102 0 21	3378	103 23 2	3395
	α Arietis	W.	56 25 3	3092	57 53 22	3099	59 21 34	3105	60 49 38	3112
	Aldebaran	W.	24 53 59	3003	26 24 9	3005	27 54 14	3010	29 24 14	3016
	Regulus	E.	56 3 34	2942	54 32 9	2954	53 1 0	2966	51 30 6	2978
	Sun	E.	99 27 7	3305	98 3 1	3317	96 39 9	3329	95 15 31	3340
5	α Arietis	W.	68 8 8	3140	69 35 29	3145	71 2 44	3150	72 29 52	3155
	Aldebaran	W.	36 52 32	3043	38 21 51	3049	39 51 3	3055	41 20 8	3060
	Regulus	E.	43 59 3	3031	42 29 29	3041	41 0 7	3051	39 30 57	3060
	Sun	E.	88 20 30	3392	86 58 4	3400	85 35 48	3408	84 13 41	3416
6	α Arietis	W.	79 44 10	3177	81 10 47	3180	82 37 21	3183	84 3 51	3186
	Aldebaran	W.	48 44 7	3081	50 12 40	3084	51 41 9	3086	53 9 35	3089
	Regulus	E.	32 7 46	3102	30 39 39	3111	29 11 43	3119	27 43 57	3128
	Sun	E.	77 25 7	3448	76 3 45	3453	74 42 28	3458	73 21 15	3461
7	α Arietis	W.	91 15 41	3194	92 41 57	3194	94 8 13	3195	95 34 27	3195
	Aldebaran	W.	60 31 10	3096	61 59 25	3096	63 27 40	3095	64 55 56	3094
	Sun	E.	66 36 4	3472	65 15 9	3472	63 54 15	3473	62 33 21	3473
8	Aldebaran	W.	72 17 36	3085	73 46 4	3082	75 14 35	3079	76 43 11	3075
	Pollux	W.	28 11 47	3110	29 39 44	3103	31 7 49	3096	32 36 2	3090
	Sun	E.	55 48 42	3468	54 27 42	3466	53 6 38	3463	51 45 32	3460
9	Aldebaran	W.	84 7 24	3052	85 36 33	3046	87 5 48	3040	88 35 10	3034
	Pollux	W.	39 59 3	3059	41 28 3	3052	42 57 10	3045	44 26 27	3038
	Sun	E.	44 59 0	3439	43 37 28	3435	42 15 50	3430	40 54 7	3425
10	Aldebaran	W.	96 4 0	3001	97 34 12	2994	99 4 33	2987	100 35 3	2979
	Pollux	W.	51 55 4	3001	53 25 16	2993	54 55 38	2985	56 26 11	2977
	Sun	E.	34 4 1	3398	32 41 42	3393	31 19 18	3387	29 56 47	3383
11	Aldebaran	W.	108 10 6	2938	109 41 38	2929	111 13 20	2921	112 45 14	2912

GREENWICH MEAN TIME.

LUNAR DISTANCES

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L of Diff.	IXh.	P. L. of Diff.
11	Pollux	W.	57° 56′ 54″	2968	59° 27′ 47″	2959	60° 58′ 52″	2950	62° 30′ 8″	2941
	Sun	E.	28 34 10	3379	27 11 30	3375	25 48 45	3372	24 25 56	3371
15	Sun	W.	18 26 15	3113	19 54 9	3090	21 22 31	3071	22 51 16	3052
	Mars	E.	64 20 0	2895	62 47 35	2887	61 14 59	2879	59 42 10	2868
	α Aquilæ	E.	79 46 33	3449	78 25 12	3449	77 3 51	3451	75 42 31	3454
	Jupiter	E.	82 33 36	2685	80 56 36	2676	79 19 24	2667	77 42 0	2658
16	Sun	W.	30 20 26	2975	31 51 11	2962	33 22 11	2950	34 53 27	2939
	Mars	E.	51 55 17	2823	50 21 19	2815	48 47 10	2806	47 12 50	2798
	α Aquilæ	E.	68 57 26	3495	67 36 56	3509	66 16 41	3525	64 56 44	3543
	Jupiter	E.	69 32 10	2617	67 53 38	2609	66 14 56	2601	64 36 3	2593
17	Sun	W.	42 23 15	2886	44 5 52	2876	45 38 42	2866	47 11 43	2857
	Mars	E.	39 18 27	2756	37 43 2	2749	36 7 27	2741	34 31 41	2733
	Jupiter	E.	56 18 58	2555	54 39 1	2548	52 58 55	2541	51 18 39	2534
	α Aquilæ	E.	58 22 56	3677	57 5 44	3713	55 49 11	3755	54 33 23	3801
	Fomalhaut	E.	86 17 4	2703	84 40 28	2696	83 3 42	2689	81 26 48	2683
	α Pegasi	E.	104 10 15	2962	102 39 15	2949	101 7 59	2936	99 36 26	2924
18	Sun	W.	54 59 50	2812	56 34 2	2803	58 8 25	2795	59 42 58	2788
	Jupiter	E.	42 54 53	2501	41 13 41	2495	39 32 19	2489	37 50 49	2483
	α Aquilæ	E.	48 28 9	4126	47 18 32	4215	46 10 20	4314	45 3 40	4425
	Fomalhaut	E.	73 20 25	2659	71 42 50	2655	70 5 10	2652	68 27 25	2650
	α Pegasi	E.	91 55 17	2877	90 22 29	2869	88 49 30	2862	87 16 23	2856
19	Sun	W.	67 38 30	2747	69 14 8	2739	70 49 57	2731	72 25 56	2723
	Antares	W.	25 35 55	2500	27 17 7	2484	28 58 43	2469	30 40 42	2455
	Venus	W.	24 24 42	2753	26 0 12	2732	27 36 9	2713	29 12 31	2696
	Jupiter	E.	29 21 18	2458	27 39 5	2453	25 56 45	2449	24 14 20	2447
	Fomalhaut	E.	60 18 10	2647	58 40 19	2649	57 2 30	2652	55 24 45	2655
	α Pegasi	E.	79 29 10	2837	77 55 30	2836	76 21 49	2835	74 48 7	2836
20	Sun	W.	80 28 24	2685	82 5 24	2678	83 42 34	2671	85 19 53	2664
	Antares	W.	39 15 0	2397	40 58 39	2388	42 42 32	2379	44 26 38	2370
	Venus	W.	37 19 27	2629	38 57 43	2617	40 36 15	2605	42 15 3	2595
	Fomalhaut	E.	47 17 56	2698	45 41 13	2719	44 4 49	2729	42 28 48	2750
	α Pegasi	E.	67 0 9	2854	65 26 51	2861	63 53 42	2870	62 20 45	2881
21	Sun	W.	93 28 51	2629	95 7 7	2622	96 45 30	2616	98 24 3	2610
	Antares	W.	53 10 10	2330	54 55 26	2323	56 40 53	2316	58 26 30	2309
	Venus	W.	50 32 26	2548	52 12 33	2539	53 52 52	2531	55 33 22	2523
	α Pegasi	E.	54 40 17	2968	53 9 24	2993	51 39 2	3022	50 9 16	3055
	α Arietis	E.	95 9 26	2419	93 26 19	2413	91 43 3	2407	89 59 38	2401
22	Sun	W.	106 38 49	2581	108 18 10	2576	109 57 37	2572	111 37 10	2568
	Antares	W.	67 16 55	2279	69 3 26	2273	70 50 5	2267	72 36 52	2262
	Venus	W.	63 58 36	2485	65 40 10	2479	67 21 52	2473	69 3 43	2467
	Mars	W.	26 29 31	2477	28 11 17	2472	29 53 10	2466	31 35 11	2462
	α Arietis	E.	81 20 39	2378	79 36 32	2374	77 52 20	2371	76 8 3	2368
23	Sun	W.	119 56 29	2548	121 36 35	2545	123 16 46	2543	124 57 0	2540

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P.L. of Diff.	XVh.	P.L. of Diff.	XVIIIh.	P.L. of Diff.	XXIh.	P.L. of Diff.
11	Pollux	W.	64° 1′ 35″	2932	65° 33′ 13″	2923	67° 5′ 3″	2914	68° 37′ 5″	2905
	Sun	E.	23 3 6	3371	21 40 17	3372	20 17 28	3374	18 54 40	3378
15	Sun	W.	24 20 25	3034	25 49 56	3016	27 19 48	3001	28 49 59	2989
	Mars	E.	58 9 10	2859	56 35 59	2850	55 2 36	2841	53 29 2	2833
	α Aquilæ	E.	74 21 16	3459	73 0 6	3465	71 39 3	3473	70 18 9	3483
	Jupiter	E.	76 4 25	2650	74 26 38	2641	72 48 40	2633	71 10 31	2625
16	Sun	W.	36 24 57	2927	37 56 41	2916	39 28 39	2906	41 0 50	2896
	Mars	E.	45 38 20	2789	44 3 38	2781	42 28 45	2772	40 53 41	2765
	α Aquilæ	E.	63 37 6	3564	62 17 52	3588	60 59 3	3615	59 40 43	3644
	Jupiter	E.	62 56 59	2585	61 17 44	2577	59 38 19	2569	57 58 43	2562
17	Sun	W.	48 44 57	2848	50 18 23	2839	51 52 0	2830	53 25 49	2821
	Mars	E.	32 55 45	2725	31 19 38	2718	29 43 20	2710	28 6 53	2701
	Jupiter	E.	49 38 13	2527	47 57 37	2520	46 16 52	2513	44 35 57	2507
	α Aquilæ	E.	53 18 22	3854	52 4 15	3913	50 51 8	3976	49 39 3	4046
	Fomalhaut	E.	79 49 46	2678	78 12 36	2673	76 35 18	2668	74 57 55	2663
	α Pegasi	E.	98 4 39	2913	96 32 37	2903	95 0 23	2894	93 27 56	2885
18	Sun	W.	61 17 43	2779	62 52 39	2771	64 27 45	2763	66 3 2	2755
	Jupiter	E.	36 9 10	2477	34 27 24	2472	32 45 29	2467	31 3 27	2462
	α Aquilæ	E.	43 58 41	4550	42 55 33	4688	41 54 22	4844	40 55 22	5025
	Fomalhaut	E.	66 49 38	2648	65 11 48	2647	63 33 56	2646	61 56 3	2646
	α Pegasi	E.	85 43 9	2851	84 9 47	2847	82 36 19	2843	81 2 47	2840
19	Sun	W.	74 2 5	2716	75 38 24	2708	77 14 54	2700	78 51 34	2692
	Antares	W.	32 22 58	2441	34 5 32	2428	35 48 27	2418	37 31 36	2408
	Venus	W.	30 49 14	2681	32 26 19	2666	34 3 44	2653	35 41 27	2640
	Jupiter	E.	22 31 52	2448	20 49 26	2450	19 7 2	2451	17 24 40	2453
	Fomalhaut	E.	53 47 5	2660	52 9 32	2668	50 32 9	2675	48 54 56	2685
	α Pegasi	E.	73 14 25	2837	71 40 45	2839	70 7 8	2842	68 33 35	2848
20	Sun	W.	86 57 22	2657	88 35 0	2650	90 12 48	2643	91 50 45	2636
	Antares	W.	46 10 56	2361	47 55 27	2353	49 40 10	2345	51 25 4	2337
	Venus	W.	43 54 4	2585	45 33 20	2575	47 12 49	2566	48 52 31	2557
	Fomalhaut	E.	40 53 14	2775	39 18 13	2803	37 43 49	2835	36 10 6	2874
	α Pegasi	E.	60 48 2	2894	59 15 35	2908	57 43 26	2925	56 11 39	2945
21	Sun	W.	100 2 44	2604	101 41 34	2598	103 20 31	2592	104 59 37	2586
	Antares	W.	60 12 16	2302	61 58 13	2296	63 44 18	2290	65 30 33	2284
	Venus	W.	57 14 4	2515	58 54 56	2507	60 36 0	2500	62 17 13	2492
	α Pegasi	E.	48 40 11	3093	47 11 53	3136	45 44 27	3184	44 17 59	3240
	α Arietis	E.	88 16 5	2396	86 32 24	2391	84 48 35	2386	83 4 40	2382
22	Sun	W.	113 16 51	2564	114 56 37	2559	116 36 29	2554	118 16 27	2551
	Antares	W.	74 23 45	2258	76 10 46	2254	77 57 53	2250	79 45 6	2246
	Venus	W.	70 45 43	2462	72 27 50	2456	74 10 6	2451	75 52 28	2446
	Mars	W.	33 17 18	2457	34 59 31	2453	36 41 51	2450	38 24 14	2446
	α Arietis	E.	74 23 43	2367	72 39 21	2365	70 54 56	2364	69 10 29	2364
23	Sun	W.	126 37 16	2538	128 17 36	2537	129 57 58	2536	131 38 20	2535

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
23	Antares	W.	81° 32′ 24″	2243	83° 19′ 48″	2240	85° 7′ 16″	2237	86° 54′ 49″	2235
	VENUS	W.	77 34 58	2441	79 17 34	2437	81 0 16	2433	82 43 4	2430
	MARS	W.	40 6 44	2443	41 49 18	2439	43 31 57	2436	45 14 40	2433
	α Arietis	E.	67 26 2	2364	65 41 35	2365	63 57 10	2366	62 12 46	2368
	Aldebaran	E.	97 36 33	2240	95 49 5	2237	94 1 32	2234	92 13 55	2232
24	VENUS	W.	91 18 8	2417	93 1 18	2416	94 44 30	2415	96 27 43	2415
	MARS	W.	53 48 59	2426	55 31 55	2426	57 14 51	2426	58 57 48	2426
	α Aquilæ	W.	54 44 26	3446	56 5 51	3393	57 28 15	3346	58 51 33	3304
	JUPITER	W.	41 18 50	2247	43 6 6	2246	44 53 23	2245	46 40 44	2245
	α Arietis	E.	53 32 13	2396	51 48 33	2405	50 5 6	2416	48 21 54	2429
	Aldebaran	E.	83 15 9	2225	81 27 18	2225	79 39 27	2225	77 51 37	2225
25	MARS	W.	67 32 16	2436	69 15 0	2438	70 57 40	2442	72 40 15	2445
	α Aquilæ	W.	65 58 53	3148	67 26 4	3128	68 53 40	3110	70 21 38	3093
	JUPITER	W.	55 37 10	2251	57 24 21	2254	59 11 27	2258	60 58 29	2261
	α Arietis	E.	39 51 15	2524	38 10 35	2553	36 30 34	2584	34 51 17	2622
	Aldebaran	E.	68 52 50	2235	67 5 15	2238	65 17 44	2242	63 30 19	2247
26	α Aquilæ	W.	77 45 25	3047	79 14 39	3045	80 43 56	3044	82 13 14	3044
	JUPITER	W.	69 52 5	2286	71 38 25	2292	73 24 35	2299	75 10 36	2307
	Fomalhaut	W.	43 12 31	2629	44 50 46	2612	46 29 24	2599	48 8 20	2588
	Aldebaran	E.	54 35 8	2276	52 48 33	2283	51 2 9	2292	49 15 58	2300
	Pollux	E.	98 41 54	2261	96 54 57	2267	95 8 10	2274	93 21 33	2281
27	α Aquilæ	W.	89 38 51	3074	91 7 32	3085	92 36 0	3096	94 4 14	3111
	JUPITER	W.	83 57 43	2350	85 42 29	2360	87 27 1	2371	89 11 18	2381
	Fomalhaut	W.	56 25 42	2566	58 5 24	2566	59 45 6	2567	61 24 45	2570
	α Pegasi	W.	42 5 57	3332	43 29 32	3276	44 54 11	3230	46 19 45	3189
	Aldebaran	E.	40 28 30	2354	38 43 49	2366	36 59 26	2380	35 15 23	2396
	Pollux	E.	84 31 20	2324	82 45 56	2334	81 0 46	2345	79 15 52	2355
28	JUPITER	W.	97 48 40	2441	99 31 16	2454	101 13 34	2467	102 55 34	2481
	Fomalhaut	W.	69 41 32	2601	71 20 25	2610	72 59 7	2619	74 37 36	2629
	α Pegasi	W.	53 37 34	3061	55 6 30	3047	56 35 44	3035	58 5 13	3027
	Pollux	E.	70 35 22	2414	68 52 7	2426	67 9 11	2439	65 26 34	2453
	Regulus	E.	106 40 17	2419	104 57 9	2432	103 14 19	2445	101 31 47	2458
29	Fomalhaut	W.	82 46 20	2689	84 23 15	2702	85 59 52	2716	87 36 10	2730
	α Pegasi	W.	65 34 27	3014	67 4 23	3016	68 34 16	3019	70 4 5	3024
	Pollux	E.	56 58 22	2526	55 17 45	2541	53 37 28	2556	51 57 32	2571
	Regulus	E.	93 3 52	2527	91 23 16	2541	89 43 0	2556	88 3 4	2571
30	α Pegasi	W.	77 31 13	3064	79 0 7	3074	80 28 48	3086	81 57 15	3097
	α Arietis	W.	33 53 39	3014	35 23 34	3000	36 53 47	2990	38 24 12	2982
	Pollux	E.	43 43 14	2651	42 5 28	2667	40 28 4	2684	38 51 3	2701
	Regulus	E.	79 48 33	2646	78 10 41	2662	76 33 10	2678	74 55 59	2693
31	α Pegasi	W.	89 15 43	3165	90 42 34	3180	92 9 7	3194	93 35 23	3210
	α Arietis	W.	45 57 40	2977	47 28 21	2981	48 58 57	2985	50 29 28	2991
	Pollux	E.	30 51 31	2786	29 16 45	2805	27 42 24	2823	26 8 25	2843
	Regulus	E.	66 55 14	2769	65 20 5	2784	63 45 17	2799	62 10 47	2814

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
23	Antares	W.	88 42 25	2233	90 30 4	2231	92 17 46	2229	94 5 30	2228
	Venus	W.	84 25 56	2426	86 8 53	2423	87 51 55	2421	89 35 0	2419
	Mars	W.	46 57 27	2431	48 40 17	2430	50 23 9	2429	52 6 3	2427
	α Arietis	E.	60 28 27	2372	58 44 12	2377	57 0 4	2382	55 16 4	2389
	Aldebaran	E.	90 26 15	2230	88 38 32	2228	86 50 46	2227	85 2 58	2226
24	Venus	W.	98 10 56	2415	99 54 10	2416	101 37 22	2416	103 20 34	2417
	Mars	W.	60 40 47	2426	62 23 43	2428	64 6 36	2430	65 49 28	2433
	α Aquilæ	W.	60 15 40	3265	61 40 32	3231	63 6 4	3201	64 32 12	3172
	Jupiter	W.	48 28 4	2246	50 15 23	2247	52 2 41	2248	53 49 57	2250
	α Arietis	E.	46 39 0	2443	44 56 26	2459	43 14 15	2477	41 32 30	2499
	Aldebaran	E.	76 3 47	2227	74 15 59	2228	72 28 13	2230	70 40 30	2232
25	Mars	W.	74 22 45	2450	76 5 8	2455	77 47 24	2461	79 29 32	2466
	α Aquilæ	W.	71 49 56	3079	73 18 31	3068	74 47 20	3059	76 16 20	3052
	Jupiter	W.	62 45 26	2265	64 32 17	2269	66 19 0	2274	68 5 37	2280
	α Arietis	E.	33 12 52	2667	31 35 28	2720	29 59 15	2780	28 24 14	2849
	Aldebaran	E.	61 43 1	2251	59 55 50	2257	58 8 47	2263	56 21 53	2269
26	α Aquilæ	W.	83 42 32	3047	85 11 46	3051	86 40 56	3057	88 9 58	3065
	Jupiter	W.	76 56 25	2315	78 42 3	2323	80 27 29	2331	82 12 43	2340
	Fomalhaut	W.	49 47 31	2580	51 26 53	2574	53 6 24	2569	54 46 1	2567
	Aldebaran	E.	47 29 59	2310	45 44 14	2320	43 58 44	2331	42 13 29	2342
	Pollux	E.	91 35 6	2289	89 48 51	2297	88 2 48	2306	86 16 57	2315
27	α Aquilæ	W.	95 32 10	3127	96 59 47	3143	98 27 4	3163	99 53 58	3184
	Jupiter	W.	90 55 19	2392	92 39 5	2405	94 22 33	2416	96 5 45	2428
	Fomalhaut	W.	63 4 21	2574	64 43 51	2580	66 23 13	2586	68 2 27	2593
	α Pegasi	W.	47 46 7	3155	49 13 10	3125	50 40 49	3100	52 8 58	3078
	Aldebaran	E.	33 31 42	2411	31 48 23	2428	30 5 28	2445	28 22 58	2465
	Pollux	E.	77 31 13	2366	75 46 50	2378	74 2 43	2390	72 18 54	2402
28	Jupiter	W.	104 37 14	2494	106 18 36	2509	107 59 37	2522	109 40 19	2538
	Fomalhaut	W.	76 15 52	2640	77 53 53	2652	79 31 38	2663	81 9 7	2675
	α Pegasi	W.	59 34 52	3020	61 4 40	3016	62 34 33	3014	64 4 30	3013
	Pollux	E.	63 44 16	2468	62 2 18	2482	60 20 39	2497	58 39 21	2511
	Regulus	E.	99 49 34	2471	98 7 40	2485	96 26 4	2499	94 44 49	2513
29	Fomalhaut	W.	89 12 10	2745	90 47 50	2760	92 23 10	2776	93 58 9	2792
	α Pegasi	W.	71 33 48	3030	73 3 24	3037	74 32 51	3045	76 2 8	3055
	Pollux	E.	50 17 57	2587	48 38 44	2602	46 59 52	2619	45 21 23	2634
	Regulus	E.	86 23 28	2586	84 44 14	2601	83 5 19	2616	81 26 46	2631
30	α Pegasi	W.	83 25 28	3110	84 53 26	3123	86 21 8	3136	87 48 34	3150
	α Arietis	W.	39 54 47	2977	41 25 28	2975	42 56 12	2974	44 26 57	2976
	Pollux	E.	37 14 23	2718	35 38 7	2735	34 2 14	2751	32 26 42	2767
	Regulus	E.	73 19 9	2708	71 42 40	2724	70 6 32	2739	68 30 43	2754
31	α Pegasi	W.	95 1 19	3327	96 26 56	3343	97 52 15	3360	99 17 13	3377
	α Arietis	W.	51 59 52	2997	53 30 9	3004	55 0 17	3011	56 30 18	3018
	Pollux	E.	24 34 53	2864	23 1 49	2884	21 29 9	2905	19 56 56	2920
	Regulus	E.	60 36 37	2828	59 2 45	2843	57 29 13	2857	55 55 59	2871

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Sat.	1	14 26 31.31	9.802	S. 14 30 47.5	−47.96	16 9.83	66.97	16 19.94	0.053
SUN.	2	14 30 26 96	9.837	14 49 51.7	47.38	16 10.07	67.09	16 20.84	0.019
Mon.	3	14 34 23.43	9.871	15 8 41.5	46.77	16 10.31	67.20	16 20.92	0.015
Tues.	4	14 38 20.74	9.906	15 27 16.6	−46.15	16 10.55	67.32	16 20.17	0.050
Wed.	5	14 42 18.89	9.941	15 45 36.5	45.51	16 10.79	67.43	16 18.57	0.085
Thur.	6	14 46 17.90	9.976	16 3 40.8	44.85	16 11.02	67.55	16 16.13	0.120
Frid.	7	14 50 17.76	10.012	16 21 29.1	−44.17	16 11.25	67.67	16 12.83	0.156
Sat.	8	14 54 18.48	10.048	16 39 1.2	43.48	16 11.48	67.79	16 8.67	0.192
SUN.	9	14 58 20.07	10.084	16 56 16.5	42.77	16 11.71	67.91	16 3.65	0.228
Mon.	10	15 2 22.52	10.120	17 13 14.4	−42.04	16 11.93	68.03	15 57.77	0.264
Tues.	11	15 6 25.83	10.156	17 29 54.6	41.29	16 12.16	68.15	15 51.04	0.300
Wed.	12	15 10 29.99	10.192	17 46 16.8	40.53	16 12.38	68.27	15 43.46	0.335
Thur.	13	15 14 35.01	10.227	18 2 20.4	−39.75	16 12.60	68.39	15 35.02	0.370
Frid.	14	15 18 40.88	10.262	18 18 5.1	38.96	16 12.81	68.51	15 25.74	0.405
Sat.	15	15 22 47.58	10.297	18 33 30.5	38.14	16 13.03	68.63	15 15.62	0.440
SUN.	16	15 26 55.11	10.331	18 48 36.2	−37.31	16 13.24	68.74	15 4.67	0.474
Mon.	17	15 31 3.47	10.365	19 3 21.8	36.46	16 13.45	68.86	14 52.89	0.508
Tues.	18	15 35 12.65	10.399	19 17 46.8	35.60	16 13.66	68.97	14 40.31	0.542
Wed.	19	15 39 22.64	10.433	19 31 50.8	−34.72	16 13.87	69.09	14 26.92	0.576
Thur.	20	15 43 33.43	10.466	19 45 33.5	33.82	16 14.07	69.20	14 12.72	0.609
Frid.	21	15 47 45.02	10.499	19 58 54.5	32.91	16 14.27	69.31	13 57.73	0.642
Sat.	22	15 51 57.39	10.531	20 11 53.6	−31.99	16 14.46	69.42	13 41.97	0.674
SUN.	23	15 56 10.53	10.563	20 24 30.3	31.05	16 14.65	69.53	13 25.43	0.706
Mon.	24	16 0 24.44	10.595	20 36 44.3	30.10	16 14.84	69.64	13 8.13	0.738
Tues.	25	16 4 39.10	10.627	20 48 35.3	−29.14	16 15.02	69.74	12 50.07	0.769
Wed.	26	16 8 54.51	10 657	21 0 2.9	28.16	16 15.20	69.84	12 31.26	0.799
Thur.	27	16 13 10.65	10.687	21 11 6.8	27.17	16 15.37	69.94	12 11.72	0.829
Frid.	28	16 17 27.50	10.717	21 21 46.9	−26.16	16 15.53	70.04	11 51.48	0.859
Sat.	29	16 21 45.07	10.746	21 32 2.7	25.14	16 15.69	70.14	11 30.54	0.888
SUN.	30	16 26 3.33	10.774	21 41 54.0	24.11	16 15.84	70.23	11 8.90	0.916
Mon.	31	16 30 22.27	10.802	S. 21 51 20.4	−23.07	16 15.99	70.32	10 46.58	0.944

Note.—The mean time of semidiameter passing may be found by subtracting 0s.19 from the sidereal time.

The sign − prefixed to the hourly change of declination indicates that south declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Sat.	1	14 26 33.98	9.803	S. 14 31 0.6	−47.96	16 19.95	0.053	14 42 53.92
SUN.	2	14 30 29.64	9.837	14 50 4.6	47.37	16 20.84	0.019	14 46 50.48
Mon.	3	14 34 26.12	9.871	15 8 54.3	46.76	16 20.91	0.015	14 50 47.03
Tues.	4	14 38 23.44	9.906	15 27 29.2	−46.14	16 20.15	0.050	14 54 43.59
Wed.	5	14 42 21.60	9.941	15 45 48.9	45.50	16 18.54	0.085	14 58 40.14
Thur.	6	14 46 20.61	9.976	16 3 53.1	44.84	16 16.09	0.120	15 2 36.70
Frid.	7	14 50 20.47	10.012	16 21 41.1	−44.16	16 12.78	0.156	15 6 33.25
Sat.	8	14 54 21.19	10.048	16 39 12.9	43.47	16 8.61	0.192	15 10 29.81
SUN.	9	14 58 22.78	10.084	16 56 27.9	42.76	16 3.58	0.228	15 14 26.36
Mon.	10	15 2 25.22	10.120	17 13 25.6	−42.03	15 57.70	0.264	15 18 22.92
Tues.	11	15 6 28.52	10.156	17 30 5.6	41.28	15 50.96	0.300	15 22 19.48
Wed.	12	15 10 32.67	10.191	17 46 27.5	40.52	15 43.37	0.335	15 26 16.04
Thur.	13	15 14 37.67	10.226	18 2 30.8	−39.74	15 34.93	0.370	15 30 12.59
Frid.	14	15 18 43.51	10.261	18 18 15.2	38.95	15 25.64	0.405	15 34 9.15
Sat.	15	15 22 50.20	10.296	18 33 40.3	38.13	15 15.51	0.440	15 38 5.70
SUN.	16	15 26 57.71	10.330	18 48 45.7	−37.30	15 4.55	0.474	15 42 2.26
Mon.	17	15 31 6.04	10.364	19 3 30.9	36.45	14 52.77	0.508	15 45 58.81
Tues.	18	15 35 15.19	10.398	19 17 55.5	35.59	14 40.18	0.542	15 49 55.37
Wed.	19	15 39 25.15	10.432	19 31 59.1	−34.71	14 26.78	0.576	15 53 51.93
Thur.	20	15 43 35.91	10.465	19 45 41.5	33.81	14 12.58	0.609	15 57 48.49
Frid.	21	15 47 47.46	10.498	19 59 2.2	32.90	13 57.58	0.642	16 1 45.04
Sat.	22	15 51 59.79	10.530	20 12 0.9	−31.98	13 41.81	0.674	16 5 41.60
SUN.	23	15 56 12.89	10.562	20 24 37.3	31.04	13 25.27	0.706	16 9 38.16
Mon.	24	16 0 26.75	10.594	20 36 50.9	30.09	13 7.97	0.738	16 13 34.72
Tues.	25	16 4 41.37	10.625	20 48 41.5	−29.13	12 49.91	0.769	16 17 31.27
Wed.	26	16 8 56.73	10.655	21 0 8.8	28.15	12 31.10	0.799	16 21 27.83
Thur.	27	16 13 12.82	10.685	21 11 12.4	27.16	12 11.56	0.829	16 25 24.38
Frid.	28	16 17 29.62	10.715	21 21 52.1	−26.15	11 51.32	0.859	16 29 20.94
Sat.	29	16 21 47.13	10.744	21 32 7.6	25.13	11 30.37	0.868	16 33 17.50
SUN.	30	16 26 5.33	10.772	21 41 58.5	24.10	11 8.73	0.916	16 37 14.06
Mon.	31	16 30 24.21	10.800	S. 21 51 24.6	−23.06	10 46.41	0.944	16 41 10.62

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign − prefixed to the hourly change of declination indicates that south declinations are increasing.

Diff. for 1 Hour, $+9^{s}.8565$. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	305	219 2 24.5	2 0.6	150.20	− 0.06	9.9964750	−45.5	9 15 34.81
2	306	220 2 30.4	2 6.3	150.29	+ 0.06	9.9963664	45.0	9 11 38.90
3	307	221 2 38.3	2 14.1	150.38	0.17	9.9962592	44.4	9 7 42.99
4	308	222 2 48.3	2 24.0	150.46	+ 0.26	9.9961532	−43.9	9 3 47.08
5	309	223 3 0.4	2 35.9	150.55	0.33	9.9960484	43.5	8 59 51.17
6	310	224 3 14.6	2 49.9	150.64	0.36	9.9959446	43.1	8 55 55.26
7	311	225 3 30.9	3 6.1	150.72	+ 0.36	9.9958417	−42.7	8 51 59.35
8	312	226 3 49.2	3 24.3	150.80	0.35	9.9957396	42.4	8 48 3.44
9	313	227 4 9.4	3 44.4	150.88	0.30	9.9956384	42.0	8 44 7.53
10	314	228 4 31.4	4 6.2	150.96	+ 0.22	9.9955380	−41.7	8 40 11.62
11	315	229 4 55.2	4 29.8	151.03	0.12	9.9954384	41.3	8 36 15.71
12	316	230 5 20.8	4 55.3	151.10	+ 0.01	9.9953396	41.0	8 32 19.80
13	317	231 5 48.1	5 22.5	151.17	− 0.11	9.9952415	−40.7	8 28 23.89
14	318	232 6 16.9	5 51.1	151.23	0.24	9.9951441	40.4	8 24 27.98
15	319	233 6 47.1	6 21.1	151.29	0.37	9.9950476	40.0	8 20 32.07
16	320	234 7 18.7	6 52.5	151.34	− 0.49	9.9949521	−39.6	8 16 36.16
17	321	235 7 51.6	7 25.3	151.39	0.60	9.9948578	39.1	8 12 40.25
18	322	236 8 25.8	7 59.4	151.45	0.68	9.9947648	38.5	8 8 44.34
19	323	237 9 1.3	8 34.7	151.50	− 0.73	9.9946731	−37.9	8 4 48.43
20	324	238 9 37.9	9 11.1	151.56	0.75	9.9945829	37.2	8 0 52.52
21	325	239 10 15.6	9 48.6	151.61	0.74	9.9944945	36.4	7 56 56.61
22	326	240 10 54.5	10 27.4	151.66	− 0.70	9.9944081	−35.6	7 53 0.70
23	327	241 11 34.5	11 7.3	151.71	0.64	9.9943237	34.7	7 49 4.78
24	328	242 12 15.7	11 48.3	151.75	0.55	9.9942414	33.8	7 45 8.87
25	329	243 12 58.1	12 30.5	151.80	− 0.43	9.9941613	−32.9	7 41 12.96
26	330	244 13 41.7	13 13.9	151.84	0.30	9.9940835	31.9	7 37 17.05
27	331	245 14 26.5	13 58.6	151.89	0.17	9.9940080	30.9	7 33 21.14
28	332	246 15 12.6	14 44.5	151.94	− 0.03	9.9939350	−29.9	7 29 25.23
29	333	247 16 0.0	15 31.7	151.99	+ 0.10	9.9938644	28.9	7 25 29.32
30	334	248 16 48.8	16 20.3	152.05	0.22	9.9937962	27.9	7 21 33.41
31	335	249 17 38.9	17 10.3	152.11	+ 0.31	9.9937303	−27.0	7 17 37.49

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January $0^d.0$.

Diff. for 1 Hour, — $9^s.8296$. (Table II.)

GREENWICH MEAN TIME.

Day of the Month.	THE MOON'S								
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 9.0	15 4.2	55 29.4	−1.54	55 11.8	−1.39	16 8.4	2.16	18.5
2	15 0.0	14 56.3	54 56.2	1.22	54 42.8	1.03	16 59.6	2.09	19.5
3	14 53.3	14 51.0	54 31.7	0.82	54 23.1	0.61	17 48.7	2.00	20.5
4	14 49.3	14 48.4	54 17.1	−0.40	54 13.7	−0.17	18 35.4	1.90	21.5
5	14 48.2	14 48.7	54 13.0	+0.05	54 14.9	+0.27	19 20.0	1.82	22.5
6	14 50.0	14 51.8	54 19.4	0.48	54 26.3	0.68	20 2.9	1.77	23.5
7	14 54.4	14 57.5	54 35.6	+0.87	54 47.0	+1.04	20 44.9	1.75	24.5
8	15 1.1	15 5.2	55 0.3	1.18	55 15.3	1.31	21 26.9	1.77	25.5
9	15 9.6	15 14.4	55 31.7	1.41	55 49.2	1.50	22 9.9	1.83	26.5
10	15 19.4	15 24.5	56 7.5	+1.55	56 26.3	+1.58	22 54.9	1.94	27.5
11	15 29.6	15 34.7	56 45.2	1.57	57 3.9	1.54	23 42.9	2.07	28.5
12	15 39.7	15 44.4	57 22.0	1.49	57 39.4	1.40	6		29.5
13	15 48.8	15 52.9	57 55.6	+1.30	58 10.5	+1.19	0 34.5	2.23	0.9
14	15 56.5	15 59.8	58 24.0	1.06	58 35.9	0.93	1 30.1	2.39	1.9
15	16 2.6	16 4.9	58 46.1	0.79	58 54.7	0.65	2 29.1	2.49	2.9
16	16 6.8	16 8.2	59 1.6	+0.51	59 6.9	+0.39	3 29.7	2.52	3.9
17	16 9.3	16 9.9	59 10.8	0.27	59 13.2	+0.15	4 30.0	2.46	4.9
18	16 10.2	16 10.2	59 14.3	+0.05	59 14.3	−0.05	5 28.0	2.35	5.9
19	16 9.9	16 9.3	59 13.2	−0.15	59 10.9	−0.24	6 22.9	2.22	6.9
20	16 8.4	16 7.2	59 7.6	0.33	59 3.1	0.42	7 14.7	2.11	7.9
21	16 5.7	16 3.9	58 57.6	0.51	58 50.9	0.61	8 4.1	2.04	8.9
22	16 1.7	15 59.3	58 43.1	−0.71	58 34.0	−0.82	8 52.4	2.01	9.9
23	15 56.4	15 53.3	58 23.6	0.92	58 12.0	1.02	9 40.4	2.01	10.9
24	15 49.8	15 46.0	57 59.2	1.12	57 45.2	1.21	10 29.1	2.06	11.9
25	15 41.9	15 37.5	57 30.1	−1.30	57 14.1	−1.37	11 19.2	2.12	12.9
26	15 32.9	15 28.3	56 57.3	1.42	56 40.1	1.45	12 10.9	2.18	13.9
27	15 23.5	15 18.7	56 22.5	1.47	56 5.0	1.45	13 3.9	2.22	14.9
28	15 14.0	15 9.5	55 47.8	−1.41	55 31.1	−1.36	13 57.3	2.21	15.9
29	15 5.2	15 1.3	55 15.4	1.27	55 0.9	1.16	14 49.8	2.15	16.9
30	14 57.7	14 54.6	54 47.8	1.03	54 36.4	0.87	15 40.4	2.05	17.9
31	14 52.0	14 50.0	54 26.9	−0.71	54 19.5	−0.52	16 28.4	1.95	18.9

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	6 17 19.23	2.2836	N.25 4 23.9	1.736
1	6 19 36.21	2.2823	25 6 4.0	1.602
2	6 21 53.11	2.2810	25 7 36.2	1.470
3	6 24 9.93	2.2797	25 9 0.4	1.338
4	6 26 26.67	2.2782	25 10 16.7	1.206
5	6 28 43.31	2.2766	25 11 25.1	1.075
6	6 30 59.86	2.2751	25 12 25.7	0.944
7	6 33 16.32	2.2735	25 13 18.4	0.812
8	6 35 32.68	2.2718	25 14 3.2	0.681
9	6 37 48.93	2.2700	25 14 40.1	0.550
10	6 40 5.08	2.2682	25 15 9.2	0.420
11	6 42 21.11	2.2663	25 15 30.5	0.289
12	6 44 37.03	2.2643	25 15 43.9	0.159
13	6 46 52.83	2.2623	25 15 49.6	+ 0.031
14	6 49 8.51	2.2603	25 15 47.6	− 0.098
15	6 51 24.07	2.2582	25 15 37.8	0.227
16	6 53 39.50	2.2561	25 15 20.3	0.355
17	6 55 54.80	2.2538	25 14 55.2	0.482
18	6 58 9.96	2.2515	25 14 22.4	0.610
19	7 0 24.98	2.2492	25 13 42.0	0.738
20	7 2 39.86	2.2468	25 12 53.9	0.865
21	7 4 54.60	2.2444	25 11 58.2	0.991
22	7 7 9.19	2.2419	25 10 55.0	1.116
23	7 9 23.63	2.2393	N.25 9 44.3	1.242

SUNDAY 2.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	7 11 37.91	2.2367	N.25 8 26.0	1.368
1	7 13 52.04	2.2341	25 7 0.2	1.492
2	7 16 6.00	2.2314	25 5 27.0	1.615
3	7 18 19.80	2.2286	25 3 46.4	1.738
4	7 20 33.43	2.2257	25 1 58.4	1.862
5	7 22 46.89	2.2229	25 0 3.0	1.985
6	7 25 0.18	2.2200	24 58 0.2	2.107
7	7 27 13.29	2.2171	24 55 50.1	2.228
8	7 29 26.23	2.2142	24 53 32.8	2.349
9	7 31 38.99	2.2112	24 51 8.2	2.470
10	7 33 51.57	2.2081	24 48 36.4	2.589
11	7 36 3.96	2.2049	24 45 57.5	2.708
12	7 38 16.16	2.2017	24 43 11.4	2.827
13	7 40 28.17	2.1986	24 40 18.2	2.946
14	7 42 39.99	2.1954	24 37 17.9	3.063
15	7 44 51.62	2.1922	24 34 10.6	3.180
16	7 47 3.05	2.1889	24 30 56.3	3.297
17	7 49 14.28	2.1856	24 27 35.0	3.413
18	7 51 25.32	2.1823	24 24 6.7	3.528
19	7 53 36.16	2.1789	24 20 31.6	3.643
20	7 55 46.79	2.1754	24 16 49.6	3.758
21	7 57 57.21	2.1719	24 13 0.7	3.872
22	8 0 7.42	2.1685	24 9 5.0	3.984
23	8 2 17.43	2.1651	24 5 2.6	4.096
24	8 4 27.23	2.1615	N.24 0 53.5	4.207

MONDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	8 4 27.23	2.1615	N.24 0 53.5	4.207
1	8 6 36.81	2.1579	23 56 37.7	4.318
2	8 8 46.18	2.1544	23 52 15.3	4.429
3	8 10 55.34	2.1508	23 47 46.2	4.539
4	8 13 4.28	2.1473	23 43 10.6	4.648
5	8 15 13.01	2.1437	23 38 28.5	4.756
6	8 17 21.52	2.1400	23 33 39.9	4.864
7	8 19 29.81	2.1363	23 28 44.8	4.972
8	8 21 37.88	2.1327	23 23 43.3	5.078
9	8 23 45.73	2.1290	23 18 35.5	5.183
10	8 25 53.36	2.1253	23 13 21.4	5.289
11	8 28 0.77	2.1216	23 8 0.9	5.394
12	8 30 7.95	2.1178	23 2 34.1	5.498
13	8 32 14.91	2.1141	22 57 1.1	5.601
14	8 34 21.65	2.1104	22 51 22.0	5.703
15	8 36 28.16	2.1067	22 45 36.8	5.804
16	8 38 34.45	2.1029	22 39 45.5	5.906
17	8 40 40.51	2.0992	22 33 48.1	6.007
18	8 42 46.35	2.0954	22 27 44.7	6.106
19	8 44 51.96	2.0917	22 21 35.4	6.205
20	8 46 57.35	2.0879	22 15 20.1	6.304
21	8 49 2.51	2.0842	22 8 58.9	6.402
22	8 51 7.45	2.0804	22 2 31.8	6.499
23	8 53 12.16	2.0767	N.21 55 59.0	6.595

TUESDAY 4.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	8 55 16.65	2.0729	N.21 49 20.4	6.691
1	8 57 20.91	2.0692	21 42 36.1	6.786
2	8 59 24.95	2.0655	21 35 46.1	6.881
3	9 1 28.77	2.0617	21 28 50.4	6.975
4	9 3 32.36	2.0580	21 21 49.1	7.067
5	9 5 35.73	2.0543	21 14 42.3	7.158
6	9 7 38.88	2.0507	21 7 30.1	7.249
7	9 9 41.81	2.0470	21 0 12.4	7.341
8	9 11 44.52	2.0432	20 52 49.2	7.432
9	9 13 47.00	2.0395	20 45 20.5	7.522
10	9 15 49.26	2.0359	20 37 46.5	7.611
11	9 17 51.31	2.0323	20 30 7.2	7.699
12	9 19 53.14	2.0287	20 22 22.6	7.787
13	9 21 54.75	2.0251	20 14 32.8	7.874
14	9 23 56.15	2.0216	20 6 37.8	7.960
15	9 25 57.34	2.0180	19 58 37.6	8.046
16	9 27 58.31	2.0144	19 50 32.3	8.130
17	9 29 59.07	2.0109	19 42 22.0	8.213
18	9 31 59.62	2.0074	19 34 6.7	8.297
19	9 33 59.96	2.0039	19 25 46.4	8.380
20	9 36 0.09	2.0005	19 17 21.1	8.462
21	9 38 0.02	1.9971	19 8 50.9	8.543
22	9 39 59.75	1.9937	19 0 15.9	8.624
23	9 41 59.27	1.9903	18 51 36.0	8.705
24	9 43 58.59	1.9870	N.18 42 51.3	8.784

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 5.					**FRIDAY 7.**				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	9 43 58.59	1.9870	N.18 42 51.3	8.784	0	11 16 12.32	1.8728	N.10 22 12.7	11.827
1	9 45 57.71	1.9837	18 34 1.9	8.863	1	11 18 4.65	1.8716	10 10 21.6	11.875
2	9 47 56.63	1.9804	18 25 7.8	8.941	2	11 19 56.91	1.8704	9 58 27.7	11.922
3	9 49 55.36	1.9772	18 16 9.0	9.018	3	11 21 49.10	1.8693	9 46 31.0	11.968
4	9 51 53.90	1.9740	18 7 5.6	9.095	4	11 23 41.23	1.8683	9 34 31.5	12.014
5	9 53 52.24	1.9708	17 57 57.6	9.172	5	11 25 33.30	1.8673	9 22 29.3	12.059
6	9 55 50.39	1.9676	17 48 45.0	9.248	6	11 27 25.31	1.8664	9 10 24.4	12.103
7	9 57 48.35	1.9645	17 39 27.9	9.322	7	11 29 17.27	1.8656	8 58 16.9	12.147
8	9 59 46.13	1.9614	17 30 6.4	9.395	8	11 31 9.18	1.8648	8 46 6.8	12.190
9	10 1 43.72	1.9583	17 20 40.5	9.468	9	11 33 1.04	1.8640	8 33 54.1	12.232
10	10 3 41.13	1.9553	17 11 10.2	9.541	10	11 34 52.86	1.8633	8 21 38.9	12.274
11	10 5 38.36	1.9524	17 1 35.5	9.614	11	11 36 44.64	1.8627	8 9 21.2	12.315
12	10 7 35.42	1.9495	16 51 56.5	9.685	12	11 38 36.38	1.8621	7 57 1.1	12.355
13	10 9 32.30	1.9465	16 42 13.3	9.756	13	11 40 28.09	1.8616	7 44 38.6	12.395
14	10 11 29.00	1.9436	16 32 25.8	9.827	14	11 42 19.77	1.8611	7 32 13.7	12.434
15	10 13 25.53	1.9408	16 22 34.1	9.896	15	11 44 11.42	1.8607	7 19 46.5	12.472
16	10 15 21.90	1.9381	16 12 38.3	9.964	16	11 46 3.05	1.8604	7 7 17.0	12.510
17	10 17 18.10	1.9353	16 2 38.4	10.032	17	11 47 54.67	1.8602	6 54 45.3	12.547
18	10 19 14.13	1.9325	15 52 34.4	10.100	18	11 49 46.27	1.8599	6 42 11.3	12.584
19	10 21 10.00	1.9298	15 42 26.4	10.167	19	11 51 37.86	1.8597	6 29 35.2	12.619
20	10 23 5.71	1.9272	15 32 14.4	10.233	20	11 53 29.44	1.8597	6 16 57.0	12.654
21	10 25 1.27	1.9246	15 21 58.4	10.299	21	11 55 21.02	1.8596	6 4 16.7	12.688
22	10 26 56.67	1.9221	15 11 38.5	10.364	22	11 57 12.59	1.8596	5 51 34.4	12.722
23	10 28 51.92	1.9197	N.15 1 14.7	10.428	23	11 59 4.17	1.8597	N. 5 38 50.1	12.756
THURSDAY 6.					**SATURDAY 8.**				
0	10 30 47.03	1.9172	N.14 50 47.1	10.492	0	12 0 55.76	1.8599	N. 5 26 3.8	12.787
1	10 32 41.99	1.9148	14 40 15.7	10.555	1	12 2 47.36	1.8601	5 13 15.6	12.818
2	10 34 36.81	1.9124	14 29 40.5	10.617	2	12 4 38.97	1.8603	5 0 25.6	12.848
3	10 36 31.48	1.9101	14 19 1.6	10.679	3	12 6 30.60	1.8607	4 47 33.8	12.878
4	10 38 26.02	1.9078	14 8 19.0	10.740	4	12 8 22.25	1.8611	4 34 40.2	12.908
5	10 40 20.42	1.9056	13 57 32.8	10.800	5	12 10 13.93	1.8615	4 21 44.8	12.937
6	10 42 14.69	1.9034	13 46 43.0	10.860	6	12 12 5.63	1.8620	4 8 47.7	12.965
7	10 44 8.83	1.9013	13 35 49.6	10.919	7	12 13 57.37	1.8626	3 55 49.0	12.992
8	10 46 2.84	1.8992	13 24 52.7	10.978	8	12 15 49.15	1.8632	3 42 48.7	13.018
9	10 47 56.73	1.8972	13 13 52.2	11.036	9	12 17 40.96	1.8639	3 29 46.8	13.044
10	10 49 50.50	1.8952	13 2 48.3	11.093	10	12 19 32.82	1.8648	3 16 43.4	13.069
11	10 51 44.15	1.8933	12 51 41.0	11.150	11	12 21 24.73	1.8657	3 3 38.6	13.093
12	10 53 37.69	1.8914	12 40 30.3	11.206	12	12 23 16.70	1.8666	2 50 32.3	13.117
13	10 55 31.12	1.8896	12 29 16.3	11.261	13	12 25 8.72	1.8675	2 37 24.6	13.139
14	10 57 24.44	1.8878	12 17 59.0	11.316	14	12 27 0.80	1.8685	2 24 15.6	13.160
15	10 59 17.65	1.8860	12 6 38.4	11.370	15	12 28 52.94	1.8696	2 11 5.4	13.181
16	11 1 10.76	1.8843	11 55 14.6	11.423	16	12 30 45.15	1.8707	1 57 53.9	13.202
17	11 3 3.77	1.8827	11 43 47.6	11.477	17	12 32 37.43	1.8719	1 44 41.2	13.222
18	11 4 56.68	1.8811	11 32 17.4	11.529	18	12 34 29.78	1.8732	1 31 27.3	13.241
19	11 6 49.50	1.8796	11 20 44.1	11.580	19	12 36 22.21	1.8746	1 18 12.3	13.258
20	11 8 42.23	1.8782	11 9 7.8	11.630	20	12 38 14.73	1.8760	1 4 56.3	13.275
21	11 10 34.88	1.8767	10 57 28.5	11.680	21	12 40 7.33	1.8774	0 51 39.3	13.292
22	11 12 27.44	1.8753	10 45 46.2	11.730	22	12 42 0.02	1.8790	0 38 21.3	13.307
23	11 14 19.92	1.8740	10 34 0.9	11.779	23	12 43 52.81	1.8807	0 25 2.4	13.322
24	11 16 12.32	1.8728	N.10 22 12.7	11.827	24	12 45 45.70	1.8824	N. 0 11 42.7	13.335

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	12 45 45.70	1.8824	N. 0 11 42.7	13.335
1	12 47 38.69	1.8841	S. 0 1 37.8	13.348
2	12 49 31.79	1.8859	0 14 59.1	13.361
3	12 51 25.00	1.8877	0 28 21.1	13.372
4	12 53 18.32	1.8896	0 41 43.7	13.382
5	12 55 11.75	1.8915	0 55 7.0	13.392
6	12 57 5.30	1.8936	1 8 30.8	13.401
7	12 58 58.98	1.8958	1 21 55.1	13.409
8	13 0 52.80	1.8981	1 35 19.9	13.416
9	13 2 46.75	1.9004	1 48 45.0	13.422
10	13 4 40.84	1.9027	2 2 10.5	13.427
11	13 6 35.07	1.9050	2 15 36.3	13.432
12	13 8 29.44	1.9074	2 29 2.3	13.435
13	13 10 23.96	1.9100	2 42 28.5	13.437
14	13 12 18.64	1.9127	2 55 54.8	13.438
15	13 14 13.48	1.9153	3 9 21.1	13.439
16	13 16 8.48	1.9180	3 22 47.5	13.439
17	13 18 3.64	1.9208	3 36 13.8	13.438
18	13 19 58.97	1.9237	3 49 40.0	13.436
19	13 21 54.48	1.9266	4 3 6.1	13.433
20	13 23 50.16	1.9295	4 16 31.9	13.428
21	13 25 46.02	1.9325	4 29 57.4	13.423
22	13 27 42.06	1.9357	4 43 22.6	13.417
23	13 29 38.30	1.9389	S. 4 56 47.4	13.409

MONDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	13 31 34.73	1.9422	S. 5 10 11.7	13.401
1	13 33 31.36	1.9455	5 23 35.5	13.392
2	13 35 28.19	1.9488	5 36 58.7	13.382
3	13 37 25.22	1.9522	5 50 21.3	13.371
4	13 39 22.46	1.9557	6 3 43.2	13.357
5	13 41 19.91	1.9593	6 17 4.2	13.343
6	13 43 17.58	1.9630	6 30 24.4	13.329
7	13 45 15.47	1.9667	6 43 43.7	13.314
8	13 47 13.58	1.9704	6 57 2.1	13.297
9	13 49 11.92	1.9742	7 10 19.4	13.279
10	13 51 10.49	1.9782	7 23 35.6	13.261
11	13 53 9.30	1.9822	7 36 50.7	13.242
12	13 55 8.35	1.9862	7 50 4.6	13.221
13	13 57 7.64	1.9902	8 3 17.2	13.198
14	13 59 7.18	1.9943	8 16 28.4	13.174
15	14 1 6.96	1.9985	8 29 38.1	13.149
16	14 3 7.00	2.0028	8 42 46.3	13.123
17	14 5 7.30	2.0072	8 55 52.9	13.097
18	14 7 7.86	2.0116	9 8 57.9	13.069
19	14 9 8.69	2.0160	9 22 1.2	13.039
20	14 11 9.78	2.0204	9 35 2.6	13.008
21	14 13 11.14	2.0250	9 48 2.2	12.977
22	14 15 12.78	2.0297	10 0 59.9	12.945
23	14 17 14.70	2.0344	10 13 55.6	12.911
24	14 19 16.90	2.0391	S. 10 26 49.2	12.876

TUESDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	14 19 16.90	2.0391	S. 10 26 49.2	12.876
1	14 21 19.39	2.0439	10 39 40.7	12.839
2	14 23 22.17	2.0487	10 52 29.9	12.801
3	14 25 25.24	2.0536	11 5 16.8	12.762
4	14 27 28.60	2.0586	11 18 1.3	12.721
5	14 29 32.27	2.0637	11 30 43.3	12.679
6	14 31 36.24	2.0687	11 43 22.8	12.637
7	14 33 40.51	2.0739	11 55 59.7	12.593
8	14 35 45.10	2.0791	12 8 33.9	12.547
9	14 37 50.00	2.0843	12 21 5.3	12.500
10	14 39 55.21	2.0895	12 33 33.9	12.452
11	14 42 0.74	2.0948	12 45 59.5	12.403
12	14 44 6.59	2.1002	12 58 22.1	12.351
13	14 46 12.77	2.1057	13 10 41.6	12.299
14	14 48 19.27	2.1111	13 22 58.0	12.246
15	14 50 26.10	2.1166	13 35 11.1	12.190
16	14 52 33.26	2.1222	13 47 20.8	12.133
17	14 54 40.76	2.1278	13 59 27.1	12.076
18	14 56 48.60	2.1335	14 11 29.9	12.017
19	14 58 56.78	2.1392	14 23 29.1	11.956
20	15 1 5.30	2.1449	14 35 24.6	11.894
21	15 3 14.17	2.1507	14 47 16.4	11.832
22	15 5 23.38	2.1564	14 59 4.4	11.767
23	15 7 32.94	2.1623	S. 15 10 48.4	11.699

WEDNESDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	15 9 42.86	2.1682	S. 15 22 28.3	11.631
1	15 11 53.13	2.1742	15 34 4.1	11.562
2	15 14 3.76	2.1801	15 45 35.8	11.492
3	15 16 14.74	2.1860	15 57 3.2	11.420
4	15 18 26.08	2.1921	16 8 26.2	11.347
5	15 20 37.79	2.1982	16 19 44.8	11.272
6	15 22 49.86	2.2042	16 30 58.8	11.195
7	15 25 2.29	2.2103	16 42 8.2	11.117
8	15 27 15.09	2.2164	16 53 12.9	11.038
9	15 29 28.26	2.2226	17 4 12.8	10.957
10	15 31 41.80	2.2287	17 15 7.8	10.875
11	15 33 55.71	2.2349	17 25 57.8	10.791
12	15 36 9.99	2.2411	17 36 42.7	10.705
13	15 38 24.64	2.2473	17 47 22.4	10.618
14	15 40 39.67	2.2536	17 57 56.9	10.531
15	15 42 55.07	2.2598	18 8 26.1	10.442
16	15 45 10.84	2.2660	18 18 49.9	10.350
17	15 47 26.99	2.2723	18 29 8.1	10.257
18	15 49 43.52	2.2786	18 39 20.7	10.163
19	15 52 0.42	2.2848	18 49 27.6	10.067
20	15 54 17.70	2.2911	18 59 28.7	9.969
21	15 56 35.36	2.2974	19 9 23.9	9.870
22	15 58 53.39	2.3037	19 19 13.1	9.769
23	16 1 11.80	2.3100	19 28 56.2	9.668
24	16 3 30.59	2.3162	S. 19 38 33.2	9.565

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 13.					SATURDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	16 3 30.59	2.3162	S. 19 38 33.2	9.565	0	18 1 12.06	2.5617	S. 24 51 51.7	3.013
1	16 5 49.75	2.3225	19 48 4.0	9.460	1	18 3 45.85	2.5646	24 54 47.6	2.850
2	16 8 9.29	2.3287	19 57 28.4	9.352	2	18 6 19.81	2.5673	24 57 33.7	2.687
3	16 10 29.20	2.3349	20 6 46.3	9.244	3	18 8 53.93	2.5700	25 0 10.0	2.522
4	16 12 49.48	2.3411	20 15 57.7	9.136	4	18 11 28.21	2.5726	25 2 36.4	2.357
5	16 15 10.13	2.3473	20 25 2.6	9.026	5	18 14 2.64	2.5751	25 4 52.9	2.192
6	16 17 31.16	2.3536	20 34 0.8	8.913	6	18 16 37.22	2.5775	25 6 59.4	2.026
7	16 19 52.56	2.3597	20 42 52.2	8.799	7	18 19 11.94	2.5797	25 8 56.0	1.859
8	16 22 14.32	2.3658	20 51 36.7	8.684	8	18 21 46.78	2.5817	25 10 42.5	1.692
9	16 24 36.45	2.3719	21 0 14.3	8.567	9	18 24 21.74	2.5836	25 12 19.0	1.524
10	16 26 58.95	2.3780	21 8 44.8	8.449	10	18 26 56.81	2.5854	25 13 45.4	1.357
11	16 29 21.81	2.3840	21 17 8.2	8.329	11	18 29 31.99	2.5871	25 15 1.8	1.189
12	16 31 45.03	2.3900	21 25 24.3	8.208	12	18 32 7.26	2.5886	25 16 8.1	1.020
13	16 34 8.61	2.3960	21 33 33.1	8.086	13	18 34 42.62	2.5901	25 17 4.2	0.851
14	16 36 32.55	2.4019	21 41 34.6	7.963	14	18 37 18.07	2.5913	25 17 50.2	0.682
15	16 38 56.84	2.4077	21 49 28.6	7.838	15	18 39 53.58	2.5923	25 18 26.0	0.512
16	16 41 21.48	2.4136	21 57 15.1	7.711	16	18 42 29.15	2.5933	25 18 51.6	0.342
17	16 43 46.47	2.4194	22 4 53.9	7.582	17	18 45 4.78	2.5942	25 19 7.0	0.172
18	16 46 11.81	2.4251	22 12 24.9	7.452	18	18 47 40.46	2.5950	25 19 12.3	− 0.002
19	16 48 37.49	2.4308	22 19 48.1	7.322	19	18 50 16.18	2.5956	25 19 7.3	+ 0.168
20	16 51 3.51	2.4365	22 27 3.5	7.190	20	18 52 51.93	2.5960	25 18 52.1	0.338
21	16 53 29.87	2.4421	22 34 10.9	7.057	21	18 55 27.70	2.5963	25 18 26.7	0.509
22	16 55 56.56	2.4476	22 41 10.3	6.922	22	18 58 3.49	2.5965	25 17 51.0	0.680
23	16 58 23.58	2.4531	S. 22 48 1.5	6.785	23	19 0 39.28	2.5964	S. 25 17 5.1	0.850
	FRIDAY 14.					SUNDAY 16.			
0	17 0 50.93	2.4585	S. 22 54 44.5	6.648	0	19 3 15.06	2.5963	S. 25 16 9.0	1.020
1	17 3 18.60	2.4637	23 1 19.3	6.510	1	19 5 50.83	2.5961	25 15 2.7	1.191
2	17 5 46.58	2.4689	23 7 45.7	6.369	2	19 8 26.59	2.5958	25 13 46.1	1.362
3	17 8 14.87	2.4741	23 14 3.6	6.228	3	19 11 2.32	2.5953	25 12 19.3	1.532
4	17 10 43.47	2.4792	23 20 13.0	6.086	4	19 13 38.02	2.5947	25 10 42.3	1.702
5	17 13 12.38	2.4843	23 26 13.9	5.943	5	19 16 13.68	2.5938	25 8 55.1	1.872
6	17 15 41.59	2.4892	23 32 6.1	5.798	6	19 18 49.28	2.5928	25 6 57.7	2.041
7	17 18 11.09	2.4941	23 37 49.6	5.652	7	19 21 24.82	2.5918	25 4 50.2	2.210
8	17 20 40.88	2.4988	23 43 24.3	5.504	8	19 24 0.30	2.5907	25 2 32.5	2.379
9	17 23 10.95	2.5035	23 48 50.1	5.356	9	19 26 35.70	2.5893	25 0 4.7	2.548
10	17 25 41.30	2.5081	23 54 7.0	5.207	10	19 29 11.02	2.5879	24 57 26.8	2.716
11	17 28 11.92	2.5126	23 59 14.9	5.056	11	19 31 46.25	2.5863	24 54 38.8	2.883
12	17 30 42.81	2.5170	24 4 13.7	4.904	12	19 34 21.38	2.5847	24 51 40.8	3.051
13	17 33 13.96	2.5213	24 9 3.4	4.752	13	19 36 56.41	2.5828	24 48 32.7	3.217
14	17 35 45.37	2.5256	24 13 43.9	4.598	14	19 39 31.32	2.5808	24 45 14.7	3.383
15	17 38 17.03	2.5296	24 18 15.2	4.444	15	19 42 6.11	2.5788	24 41 46.7	3.550
16	17 40 48.92	2.5335	24 22 37.2	4.288	16	19 44 40.78	2.5766	24 38 8.7	3.716
17	17 43 21.05	2.5375	24 26 49.8	4.132	17	19 47 15.31	2.5743	24 34 20.8	3.880
18	17 45 53.42	2.5413	24 30 53.0	3.975	18	19 49 49.70	2.5720	24 30 23.1	4.044
19	17 48 26.01	2.5450	24 34 46.8	3.817	19	19 52 23.95	2.5695	24 26 15.5	4.207
20	17 50 58.82	2.5485	24 38 31.0	3.657	20	19 54 58.04	2.5668	24 21 58.2	4.370
21	17 53 31.83	2.5519	24 42 5.6	3.497	21	19 57 31.97	2.5641	24 17 31.1	4.532
22	17 56 5.04	2.5552	24 45 30.6	3.337	22	20 0 5.73	2.5612	24 12 54.3	4.693
23	17 58 38.45	2.5585	24 48 46.0	3.176	23	20 2 39.32	2.5582	24 8 7.9	4.854
24	18 1 12.06	2.5617	S. 24 51 51.7	3.013	24	20 5 12.72	2.5552	S. 24 3 11.8	5.014

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 17.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	20 5 12.72	2.5552	S.24 3 11.8	5.014
1	20 7 45.94	2.5521	23 58 6.2	5.173
2	20 10 18.97	2.5488	23 52 51.0	5.332
3	20 12 51.80	2.5455	23 47 26.4	5.489
4	20 15 24.43	2.5420	23 41 52.4	5.645
5	20 17 56.84	2.5384	23 36 9.0	5.801
6	20 20 29.04	2.5348	23 30 16.3	5.955
7	20 23 1.02	2.5311	23 24 14.4	6.109
8	20 25 32.78	2.5273	23 18 3.3	6.262
9	20 28 4.30	2.5234	23 11 43.0	6.414
10	20 30 35.59	2.5195	23 5 13.6	6.564
11	20 33 6.64	2.5155	22 58 35.3	6.713
12	20 35 37.45	2.5114	22 51 48.1	6.861
13	20 38 8.01	2.5072	22 44 52.0	7.009
14	20 40 38.32	2.5030	22 37 47.0	7.156
15	20 43 8.37	2.4987	22 30 33.3	7.300
16	20 45 38.16	2.4943	22 23 11.0	7.444
17	20 48 7.68	2.4899	22 15 40.0	7.587
18	20 50 36.94	2.4854	22 8 0.5	7.729
19	20 53 5.93	2.4808	22 0 12.5	7.870
20	20 55 34.64	2.4762	21 52 16.1	8.009
21	20 58 3.07	2.4716	21 44 11.4	8.147
22	21 0 31.23	2.4669	21 35 58.4	8.284
23	21 2 59.10	2.4622	S.21 27 37.3	8.419

TUESDAY 18.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	21 5 26.69	2.4574	S.21 19 8.1	8.553
1	21 7 53.99	2.4526	21 10 30.9	8.687
2	21 10 21.00	2.4477	21 1 45.7	8.819
3	21 12 47.72	2.4428	20 52 52.6	8 950
4	21 15 14.14	2.4379	20 43 51.7	9.079
5	21 17 40.27	2.4330	20 34 43.1	9 207
6	21 20 6.10	2.4280	20 25 26.9	9.333
7	21 22 31.63	2.4230	20 16 3.1	9.458
8	21 24 56.86	2.4181	20 6 31.9	9.582
9	21 27 21.80	2.4131	19 56 53.3	9.704
10	21 29 46.43	2.4080	19 47 7.4	9.826
11	21 32 10.76	2.4029	19 37 14.2	9.946
12	21 34 34.78	2.3978	19 27 13.9	10.064
13	21 36 58.50	2.3927	19 17 6.5	10.182
14	21 39 21.91	2.3877	19 6 52.1	10.297
15	21 41 45.02	2.3827	18 56 30.9	10.410
16	21 44 7.83	2.3776	18 46 2.9	10.523
17	21 46 30.33	2.3724	18 35 28.1	10.635
18	21 48 52.52	2.3673	18 24 46.7	10.745
19	21 51 14.41	2.3622	18 13 58.7	10.853
20	21 53 35.99	2.3572	18 3 4.3	10.960
21	21 55 57.27	2.3522	17 52 3.5	11.066
22	21 58 18.25	2.3471	17 40 56.4	11.170
23	22 0 38.92	2.3420	17 29 43.1	11.272
24	22 2 59.29	2.3370	S.17 18 23.7	11.374

WEDNESDAY 19.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	22 2 59.29	2.3370	S.17 18 23.7	11.374
1	22 5 19.36	2.3320	17 6 58.2	11.474
2	22 7 39.13	2.3271	16 55 26.8	11.573
3	22 9 58.61	2.3222	16 43 49.5	11.670
4	22 12 17.79	2.3172	16 32 6.4	11.765
5	22 14 36.67	2.3122	16 20 17.7	11.858
6	22 16 55.25	2.3072	16 8 23.4	11.951
7	22 19 13.54	2.3024	15 56 23.6	12.043
8	22 21 31.54	2.2977	15 44 18.3	12.133
9	22 23 49.26	2.2929	15 32 7.7	12.221
10	22 26 6.69	2.2882	15 19 51.8	12.307
11	22 28 23.84	2.2834	15 7 30.8	12.392
12	22 30 40.70	2.2787	14 55 4.7	12.476
13	22 32 57.28	2.2740	14 42 33.7	12.558
14	22 35 13.58	2.2694	14 29 57.8	12.639
15	22 37 29.61	2.2648	14 17 17.0	12.720
16	22 39 45.36	2.2603	14 4 31.4	12.796
17	22 42 0.85	2.2559	13 51 41.2	12.874
18	22 44 16.07	2.2514	13 38 46.5	12.949
19	22 46 31.02	2.2470	13 25 47.3	13.022
20	22 48 45.71	2.2427	13 12 43.8	13.094
21	22 51 0.14	2.2384	12 59 36.0	13.165
22	22 53 14.32	2.2341	12 46 24.0	13.234
23	22 55 28.24	2.2299	S.12 33 7.9	13.302

THURSDAY 20.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	22 57 41.91	2.2258	S.12 19 47.7	13.369
1	22 59 55.34	2.2217	12 6 23.6	13.434
2	23 2 8.52	2.2177	11 52 55.6	13.497
3	23 4 21.46	2.2137	11 39 23.9	13.559
4	23 6 34.16	2.2098	11 25 48.5	13.620
5	23 8 46.63	2.2059	11 12 9.5	13.679
6	23 10 58.87	2.2021	10 58 27.0	13.737
7	23 13 10.88	2.1983	10 44 41.1	13.793
8	23 15 22.67	2.1947	10 30 51.8	13.848
9	23 17 34.24	2.1910	10 16 59.3	13.902
10	23 19 45.59	2.1874	10 3 3.6	13.954
11	23 21 56.73	2.1839	9 49 4.8	14.005
12	23 24 7.66	2.1804	9 35 3.0	14.054
13	23 26 18.38	2.1771	9 20 58.3	14.102
14	23 28 28.91	2.1738	9 6 50.8	14.148
15	23 30 39.24	2.1705	8 52 40.5	14.193
16	23 32 49.37	2.1673	8 38 27.6	14.237
17	23 34 59.32	2.1642	8 24 12.1	14.278
18	23 37 9.08	2.1612	8 9 54.2	14.318
19	23 39 18.66	2.1582	7 55 33.9	14.358
20	23 41 28.06	2.1552	7 41 11.2	14.397
21	23 43 37.28	2.1523	7 26 46.2	14.434
22	23 45 46.33	2.1495	7 12 19.1	14.469
23	23 47 55.22	2.1468	6 57 49.9	14.503
24	23 50 3.95	2.1442	S. 6 43 18.8	14.534

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	23 50 3.95	2.1442	S. 6 43 18.8	14.534
1	23 52 12.52	2.1416	6 28 45.8	14.566
2	23 54 20.94	2.1390	6 14 10.9	14.596
3	23 56 29.20	2.1365	5 59 34.3	14.694
4	23 58 37.32	2.1342	5 44 56.0	14.652
5	0 0 45.30	2.1319	5 30 16.1	14.677
6	0 2 53.15	2.1297	5 15 34.8	14.700
7	0 5 0.86	2.1275	5 0 52.1	14.723
8	0 7 8.45	2.1254	4 46 8.0	14.745
9	0 9 15.91	2.1233	4 31 22.7	14.764
10	0 11 23.25	2.1214	4 16 36.3	14.783
11	0 13 30.48	2.1195	4 1 48.7	14.802
12	0 15 37.59	2.1177	3 47 0.1	14.818
13	0 17 44.60	2.1160	3 32 10.6	14.832
14	0 19 51.51	2.1143	3 17 20.3	14.845
15	0 21 58.31	2.1196	3 2 29.2	14.857
16	0 24 5.02	2.1111	2 47 37.5	14.867
17	0 26 11.64	2.1096	2 32 45.2	14.877
18	0 28 18.17	2.1082	2 17 52.3	14.885
19	0 30 24.62	2.1069	2 2 59.0	14.891
20	0 32 31.00	2.1056	1 48 5.4	14.897
21	0 34 37.30	2.1044	1 33 11.4	14.902
22	0 36 43.53	2.1033	1 18 17.2	14.904
23	0 38 49.70	2.1023	S. 1 3 22.9	14.905

SATURDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	0 40 55.81	2.1013	S. 0 48 28.6	14.905
1	0 43 1.86	2.1004	0 33 34.3	14.904
2	0 45 7.86	2.0996	0 18 40.1	14.901
3	0 47 13.81	2.0988	S. 0 3 46.2	14.896
4	0 49 19.72	2.0981	N. 0 11 7.4	14.891
5	0 51 25.59	2.0975	0 26 0.7	14.885
6	0 53 31.42	2.0969	0 40 53.6	14.877
7	0 55 37.22	2.0965	0 55 46.0	14.868
8	0 57 43.00	2.0961	1 10 37.8	14.857
9	0 59 48.75	2.0957	1 25 28.8	14.844
10	1 1 54.48	2.0954	1 40 19.1	14.831
11	1 4 0.20	2.0952	1 55 8.6	14.817
12	1 6 5.90	2.0950	2 9 57.2	14.802
13	1 8 11.60	2.0950	2 24 44.8	14.785
14	1 10 17.30	2.0949	2 39 31.4	14.767
15	1 12 22.99	2.0949	2 54 16.8	14.747
16	1 14 28.69	2.0951	3 9 1.0	14.726
17	1 16 34.40	2.0953	3 23 43.9	14.703
18	1 18 40.12	2.0955	3 38 25.4	14.680
19	1 20 45.86	2.0958	3 53 5.5	14.656
20	1 22 51.62	2.0962	4 7 44.1	14.629
21	1 24 57.40	2.0966	4 22 21.0	14.601
22	1 27 3.21	2.0971	4 36 56.2	14.572
23	1 29 9.05	2.0976	4 51 29.7	14.543
24	1 31 14.92	2.0982	N. 5 6 1.4	14.512

SUNDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	1 31 14.92	2.0982	N. 5 6 1.4	14.512
1	1 33 20.83	2.0989	5 20 31.2	14.479
2	1 35 26.79	2.0996	5 34 58.9	14.445
3	1 37 32.79	2.1004	5 49 24.6	14.411
4	1 39 38.84	2.1013	6 3 48.2	14.374
5	1 41 44.95	2.1022	6 18 9.5	14.336
6	1 43 51.11	2.1032	6 32 28.5	14.297
7	1 45 57.33	2.1042	6 46 45.2	14.257
8	1 48 3.62	2.1053	7 0 59.4	14.216
9	1 50 9.97	2.1064	7 15 11.1	14.173
10	1 52 16.39	2.1076	7 29 20.2	14.129
11	1 54 22.88	2.1088	7 43 26.6	14.084
12	1 56 29.45	2.1101	7 57 30.3	14.038
13	1 58 36.10	2.1115	8 11 31.2	13.991
14	2 0 42.83	2.1129	8 25 29.2	13.941
15	2 2 49.65	2.1144	8 39 24.1	13.890
16	2 4 56.56	2.1159	8 53 16.0	13.839
17	2 7 3.56	2.1175	9 7 4.8	13.787
18	2 9 10.66	2.1191	9 20 50.4	13.733
19	2 11 17.85	2.1207	9 34 32.7	13.678
20	2 13 25.14	2.1224	9 48 11.7	13.622
21	2 15 32.54	2.1242	10 1 47.3	13.564
22	2 17 40.04	2.1259	10 15 19.4	13.505
23	2 19 47.65	2.1277	N.10 28 47.9	13.444

MONDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	2 21 55.37	2.1296	N.10 42 12.7	13.383
1	2 24 3.20	2.1315	10 55 33.8	13.321
2	2 26 11.15	2.1335	11 8 51.2	13.258
3	2 28 19.22	2.1355	11 22 4.7	13.193
4	2 30 27.41	2.1376	11 35 14.3	13.127
5	2 32 35.73	2.1396	11 48 19.9	13.060
6	2 34 44.17	2.1417	12 1 21.5	12.992
7	2 36 52.73	2.1438	12 14 18.9	12.922
8	2 39 1.43	2.1461	12 27 12.1	12.851
9	2 41 10.26	2.1483	12 40 1.0	12.778
10	2 43 19.22	2.1505	12 52 45.5	12.705
11	2 45 28.32	2.1528	13 5 25.6	12.631
12	2 47 37.56	2.1551	13 18 1.2	12.555
13	2 49 46.93	2.1574	13 30 32.2	12.478
14	2 51 56.45	2.1598	13 42 58.6	12.401
15	2 54 6.11	2.1622	13 55 20.3	12.322
16	2 56 15.91	2.1646	14 7 37.2	12.242
17	2 58 25.86	2.1670	14 19 49.3	12.161
18	3 0 35.95	2.1694	14 31 56.5	12.078
19	3 2 46.19	2.1719	14 43 58.7	11.995
20	3 4 56.58	2.1744	14 55 55.9	11.910
21	3 7 7.12	2.1769	15 7 47.9	11.824
22	3 9 17.81	2.1794	15 19 34.7	11.737
23	3 11 28.65	2.1820	15 31 16.3	11.649
24	3 13 39.65	2.1846	N.15 42 52.6	11.560

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 25.					THURSDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	3 13 39.65	2.1846	N.15 42 52.6	11.560	0	5 1 22.88	2.2947	N.22 56 36.4	6.193
1	3 15 50.80	2.1872	15 54 23.5	11.470	1	5 3 40.60	2.2961	23 2 44.1	6.063
2	3 18 2.11	2.1897	16 5 49.0	11.379	2	5 5 58.41	2.2975	23 8 44.0	5.932
3	3 20 13.57	2.1923	16 17 9.0	11.287	3	5 8 16.30	2.2987	23 14 36.0	5.802
4	3 22 25.19	2.1949	16 28 23.4	11.193	4	5 10 34.26	2.2999	23 20 20.2	5.672
5	3 24 36.96	2.1975	16 39 32.1	11.098	5	5 12 52.29	2.3011	23 25 56.6	5.541
6	3 26 48.89	2.2002	16 50 35.1	11.003	6	5 15 10.39	2.3022	23 31 25.1	5.409
7	3 29 0.98	2.2028	17 1 32.4	10.907	7	5 17 28.56	2.3032	23 36 45.7	5.277
8	3 31 13.23	2.2054	17 12 23.9	10.809	8	5 19 46.78	2.3042	23 41 58.3	5.144
9	3 33 25.63	2.2080	17 23 9.5	10.711	9	5 22 5.06	2.3051	23 47 3.0	5.012
10	3 35 38.19	2.2106	17 33 49.2	10.611	10	5 24 23.39	2.3059	23 51 59.7	4.879
11	3 37 50.91	2.2132	17 44 22.8	10.509	11	5 26 41.77	2.3067	23 56 48.4	4.746
12	3 40 3.78	2.2158	17 54 50.3	10.408	12	5 29 0.19	2.3074	24 1 29.2	4.612
13	3 42 16.81	2.2185	18 5 11.7	10.306	13	5 31 18.65	2.3080	24 6 1.9	4.478
14	3 44 30.00	2.2211	18 15 27.0	10.203	14	5 33 37.15	2.3086	24 10 26.6	4.344
15	3 46 43.34	2.2237	18 25 36.0	10.098	15	5 35 55.68	2.3090	24 14 43.2	4.209
16	3 48 56.84	2.2263	18 35 38.7	9.993	16	5 38 14.23	2.3094	24 18 51.7	4.075
17	3 51 10.50	2.2289	18 45 35.1	9.887	17	5 40 32.81	2.3098	24 22 52.2	3.941
18	3 53 24.31	2.2314	18 55 25.1	9.779	18	5 42 51.41	2.3101	24 26 44.6	3.806
19	3 55 38.27	2.2340	19 5 8.6	9.671	19	5 45 10.02	2.3102	24 30 28.9	3.671
20	3 57 52.39	2.2366	19 14 45.6	9.562	20	5 47 28.63	2.3103	24 34 5.1	3.535
21	4 0 6.66	2.2391	19 24 16.0	9.452	21	5 49 47.25	2.3103	24 37 33.1	3.399
22	4 2 21.08	2.2416	19 33 39.8	9.341	22	5 52 5.87	2.3103	24 40 53.0	3.265
23	4 4 35.65	2.2440	N.19 42 56.9	9.229	23	5 54 24.48	2.3102	N.24 44 4.9	3.130
	WEDNESDAY 26.					FRIDAY 28.			
0	4 6 50.36	2.2464	N.19 52 7.3	9.116	0	5 56 43.09	2.3100	N.24 47 8.6	2.994
1	4 9 5.22	2.2489	20 1 10.9	9.002	1	5 59 1.68	2.3097	24 50 4.2	2.858
2	4 11 20.23	2.2513	20 10 7.6	8.888	2	6 1 20.25	2.3093	24 52 51.6	2.722
3	4 13 35.38	2.2537	20 18 57.5	8.774	3	6 3 38.80	2.3089	24 55 30.9	2.587
4	4 15 50.67	2.2560	20 27 40.5	8.658	4	6 5 57.32	2.3083	24 58 2.0	2.451
5	4 18 6.10	2.2583	20 36 16.5	8.541	5	6 8 15.80	2.3077	25 0 25.0	2.316
6	4 20 21.67	2.2607	20 44 45.4	8.423	6	6 10 34.25	2.3071	25 2 39.9	2.181
7	4 22 37.38	2.2629	20 53 7.3	8.305	7	6 12 52.65	2.3064	25 4 46.7	2.045
8	4 24 53.22	2.2651	21 1 22.0	8.186	8	6 15 11.01	2.3056	25 6 45.3	1.909
9	4 27 9.19	2.2673	21 9 29.6	8.067	9	6 17 29.32	2.3047	25 8 35.7	1.773
10	4 29 25.29	2.2694	21 17 30.0	7.946	10	6 19 47.57	2.3037	25 10 18.0	1.638
11	4 31 41.52	2.2715	21 25 23.1	7.825	11	6 22 5.76	2.3026	25 11 52.3	1.504
12	4 33 57.87	2.2736	21 33 9.0	7.703	12	6 24 23.88	2.3014	25 13 18.5	1.369
13	4 36 14.35	2.2756	21 40 47.5	7.580	13	6 26 41.93	2.3002	25 14 36.6	1.234
14	4 38 30.94	2.2775	21 48 18.6	7.457	14	6 28 59.91	2.2990	25 15 46.6	1.099
15	4 40 47.65	2.2795	21 55 42.4	7.334	15	6 31 17.81	2.2976	25 16 48.5	0.965
16	4 43 4.48	2.2814	22 2 58.7	7.209	16	6 33 35.62	2.2961	25 17 42.4	0.831
17	4 45 21.42	2.2832	22 10 7.5	7.083	17	6 35 53.34	2.2946	25 18 28.3	0.697
18	4 47 38.47	2.2850	22 17 8.7	6.958	18	6 38 10.97	2.2930	25 19 6.1	0.563
19	4 49 55.62	2.2868	22 24 2.4	6.832	19	6 40 28.50	2.2913	25 19 35.9	0.430
20	4 52 12.88	2.2885	22 30 48.5	6.705	20	6 42 45.93	2.2896	25 19 57.7	0.297
21	4 54 30.24	2.2901	22 37 27.0	6.577	21	6 45 3.25	2.2877	25 20 11.6	0.165
22	4 56 47.69	2.2917	22 43 57.8	6.449	22	6 47 20.46	2.2858	25 20 17.5	+ 0.033
23	4 59 5.24	2.2932	22 50 20.9	6.322	23	6 49 37.55	2.2839	25 20 15.5	− 0.099
24	5 1 22.88	2.2947	N.22 56 36.4	6.193	24	6 51 54.53	2.2819	N.25 20 5.6	0.231

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	6 51 54.53	2.2819	N.25 20 5.6	0.231
1	6 54 11.38	2.2797	25 19 47.8	0.362
2	6 56 28.10	2.2775	25 19 22.1	0.494
3	6 58 44.68	2.2753	25 18 48.5	0.625
4	7 1 1.13	2.2730	25 18 7.1	0.755
5	7 3 17.44	2.2706	25 17 17.9	0.884
6	7 5 33.60	2.2682	25 16 21.0	1.013
7	7 7 49.62	2.2657	25 15 16.3	1.142
8	7 10 5.48	2.2630	25 14 3.9	1.271
9	7 12 21.18	2.2603	25 12 43.8	1.399
10	7 14 36.72	2.2576	25 11 16.1	1.526
11	7 16 52.09	2.2548	25 9 40.7	1.653
12	7 19 7.30	2.2521	25 7 57.7	1.780
13	7 21 22.34	2.2492	25 6 7.1	1.906
14	7 23 37.20	2.2462	25 4 9.0	2.031
15	7 25 51.88	2.2432	25 2 3.4	2.156
16	7 28 6.38	2.2401	24 59 50.3	2.280
17	7 30 20.69	2.2369	24 57 29.8	2.403
18	7 32 34.81	2.2337	24 55 1.9	2.526
19	7 34 48.74	2.2305	24 52 26.6	2.649
20	7 37 2.47	2.2272	24 49 44.0	2.772
21	7 39 16.01	2.2239	24 46 54.0	2.893
22	7 41 29.34	2.2205	24 43 56.8	3.013
23	7 43 42.47	2.2171	N.24 40 52.4	3.133

SUNDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	7 45 55.39	2.2136	N.24 37 40.8	3.253
1	7 48 8.10	2.2101	24 34 22.0	3.372
2	7 50 20.60	2.2065	24 30 56.1	3.490
3	7 52 32.88	2.2029	24 27 23.2	3.607
4	7 54 44.95	2.1992	24 23 43.3	3.723
5	7 56 56.79	2.1955	24 19 56.4	3.840
6	7 59 8.41	2.1918	24 16 2.5	3.956
7	8 1 19.81	2.1881	24 12 1.7	4.070
8	8 3 30.98	2.1843	24 7 54.1	4.184
9	8 5 41.92	2.1804	24 3 39.6	4.298
10	8 7 52.63	2.1766	23 59 18.3	4.411
11	8 10 3.11	2.1727	23 54 50.3	4.522
12	8 12 13.36	2.1688	23 50 15.6	4.633
13	8 14 23.37	2.1648	23 45 34.3	4.744
14	8 16 33.14	2.1608	23 40 46.3	4.855
15	8 18 42.67	2.1568	23 35 51.7	4.964
16	8 20 51.96	2.1528	23 30 50.6	5.071
17	8 23 1.01	2.1488	23 25 43.1	5.178
18	8 25 9.82	2.1447	23 20 29.2	5.285
19	8 27 18.38	2.1407	23 15 8.9	5.392
20	8 29 26.70	2.1366	23 9 42.2	5.498
21	8 31 34.77	2.1324	23 4 9.2	5.603
22	8 33 42.59	2.1283	22 58 29.9	5.706
23	8 35 50.17	2.1241	22 52 44.5	5.809
24	8 37 57.49	2.1199	N.22 46 52.9	5.911

MONDAY, DECEMBER 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	8 37 57.49	2.1199	N.22 46 52.9	5.911

PHASES OF THE MOON.

		d	h	m
☾ Last Quarter . .	Nov.	4	4	13.0
● New Moon		12	1	37.6
☽ First Quarter . . .		19	0	44.6
○ Full Moon		26	1	22.8

		d	h
☾ Apogee. . . .	Nov.	4	21.2
☾ Perigee.		18	6.0

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L of Diff.	III^h.	P. L. of Diff.	VI^h.	P. L. of Diff.	IX^h.	P. L. of Diff.
1	α Arietis	W.	58° 0′ 9″	3025	59° 29′ 51″	3033	60° 59′ 23″	3041	62° 28′ 45″	3049
	Aldebaran	W.	26 36 29	2938	28 8 0	2944	29 39 23	2950	31 10 38	2957
	Regulus	E.	54 23 3	2884	52 50 24	2898	51 18 4	2912	49 46 0	2925
	SATURN	E.	70 30 47	2905	68 58 34	2918	67 26 38	2931	65 54 58	2943
	SUN	E.	125 5 39	3239	123 40 16	3252	122 15 9	3265	120 50 17	3278
2	α Arietis	W.	69 53 8	3089	71 21 31	3097	72 49 45	3105	74 17 49	3112
	Aldebaran	W.	38 44 34	2996	40 14 52	3003	41 45 0	3011	43 14 59	3019
	Regulus	E.	42 9 50	2989	40 39 23	3001	39 9 11	3013	37 39 14	3025
	SATURN	E.	58 20 26	3001	56 50 14	3011	55 20 15	3022	53 50 29	3031
	SUN	E.	113 49 39	3338	112 26 12	3348	111 2 58	3359	109 39 55	3369
3	α Arietis	W.	81 36 2	3145	83 3 17	3151	84 30 26	3157	85 57 27	3162
	Aldebaran	W.	50 42 42	3052	52 11 51	3058	53 40 53	3063	55 9 48	3067
	Regulus	E.	30 13 5	3083	28 44 35	3095	27 16 19	3108	25 48 19	3120
	SATURN	E.	46 24 28	3074	44 55 47	3081	43 27 14	3089	41 58 51	3095
	SUN	E.	102 47 21	3413	101 25 19	3419	100 3 24	3425	98 41 36	3432
4	α Arietis	W.	93 11 8	3183	94 37 37	3186	96 4 2	3189	97 30 24	3191
	Aldebaran	W.	62 33 9	3085	64 1 37	3087	65 30 2	3089	66 58 25	3090
	Pollux	W.	18 29 51	3143	19 57 9	3137	21 24 35	3131	22 52 7	3125
	SATURN	E.	34 38 45	3123	33 11 3	3129	31 43 28	3133	30 15 58	3137
	SUN	E.	91 54 11	3454	90 32 56	3457	89 11 44	3460	87 50 35	3462
5	Aldebaran	W.	74 20 8	3090	75 48 30	3089	77 16 53	3087	78 45 20	3084
	Pollux	W.	30 11 10	3105	31 39 13	3101	33 7 21	3097	34 35 34	3093
	Spica	E.	60 38 56	3107	59 10 55	3107	57 42 54	3106	56 14 53	3106
	SUN	E.	81 5 9	3463	79 44 3	3461	78 22 56	3459	77 1 46	3457
6	Aldebaran	W.	86 8 25	3065	87 37 17	3060	89 6 15	3055	90 35 20	3049
	Pollux	W.	41 58 0	3069	43 26 48	3062	44 55 44	3056	46 24 48	3050
	Spica	E.	48 54 19	3096	47 26 5	3093	45 57 47	3090	44 29 25	3087
	SUN	E.	70 15 6	3438	68 53 32	3432	67 31 51	3426	66 12 4	3419
7	Aldebaran	W.	98 2 43	3014	99 32 39	3006	101 2 44	2997	102 33 1	2989
	Pollux	W.	53 52 18	3010	55 22 18	3002	56 52 28	2993	58 22 50	2983
	Regulus	W.	18 10 23	3126	19 38 1	3104	21 6 6	3084	22 34 35	3063
	Spica	E.	37 6 37	3070	35 37 52	3068	34 9 3	3066	32 40 14	3065
	SUN	E.	59 19 9	3381	57 56 31	3372	56 33 43	3363	55 10 44	3355
8	Aldebaran	W.	110 7 14	2940	111 38 41	2930	113 10 22	2920	114 42 16	2909
	Pollux	W.	65 57 41	2931	67 29 20	2921	69 1 11	2910	70 33 17	2899
	Regulus	W.	30 3 5	2975	31 33 49	2960	33 4 52	2945	34 36 14	2931
	SUN	E.	48 12 56	3300	46 48 45	3289	45 24 20	3277	43 59 42	3265
9	Pollux	W.	78 17 29	2839	79 51 6	2827	81 25 0	2815	82 59 9	2803
	Regulus	W.	42 17 37	2860	43 50 47	2845	45 24 16	2832	46 58 2	2818
	SUN	E.	36 52 56	3204	35 26 51	3191	34 0 30	3178	32 33 54	3166
10	Pollux	W.	90 54 6	2737	92 29 57	2725	94 6 4	2712	95 42 28	2700
	Regulus	W.	54 51 25	2750	56 26 59	2736	58 2 52	2722	59 39 2	2709
	SUN	E.	25 17 4	3103	23 48 58	3091	22 20 37	3079	20 52 2	3069

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	α Arietis	W.	63° 57′ 58″	3057	65° 27′ 0″	3065	66° 55′ 53″	3072	68° 24′ 35″	3081
	Aldebaran	W.	32 41 44	2965	34 12 41	2973	35 43 29	2981	37 14 6	2988
	Regulus	E.	48 14 14	2939	46 42 44	2951	45 11 30	2964	43 40 32	2976
	SATURN	E.	64 23 34	2955	62 52 25	2967	61 21 31	2979	59 50 52	2989
	SUN	E.	119 25 41	3292	118 1 20	3304	116 37 13	3315	115 13 19	3326
2	α Arietis	W.	75 45 45	3119	77 13 32	3126	78 41 10	3133	80 8 40	3139
	Aldebaran	W.	44 44 48	3026	46 14 29	3032	47 44 1	3039	49 13 25	3046
	Regulus	E.	36 9 31	3036	34 40 3	3048	33 10 49	3060	31 41 50	3072
	SATURN	E.	52 20 55	3040	50 51 32	3049	49 22 20	3058	47 53 19	3066
	SUN	E.	108 17 4	3379	106 54 23	3387	105 31 53	3396	104 9 32	3404
3	α Arietis	W.	87 24 22	3167	88 51 11	3171	90 17 55	3175	91 44 34	3179
	Aldebaran	W.	56 38 38	3071	58 7 23	3075	59 36 2	3079	61 4 37	3082
	Regulus	E.	24 20 34	3137	22 53 9	3154	21 26 5	3171	19 59 21	3186
	SATURN	E.	40 30 35	3101	39 2 27	3107	37 34 26	3113	36 6 32	3119
	SUN	E.	97 19 56	3438	95 58 22	3442	94 36 54	3446	93 15 30	3450
4	α Arietis	W.	98 56 44	3193	100 23 2	3195	101 49 17	3197	103 15 30	3198
	Aldebaran	W.	68 26 47	3091	69 55 7	3091	71 23 27	3091	72 51 47	3091
	Pollux	W.	24 19 44	3120	25 47 29	3116	27 15 18	3113	28 43 12	3109
	SATURN	E.	28 48 33	3142	27 21 14	3146	25 54 0	3150	24 26 51	3156
	SUN	E.	86 29 28	3463	85 8 23	3464	83 47 18	3464	82 26 14	3464
5	Aldebaran	W.	80 13 49	3082	81 42 21	3078	83 10 58	3074	84 39 39	3070
	Pollux	W.	36 3 51	3089	37 32 14	3084	39 0 43	3079	40 29 18	3074
	Spica	E.	54 46 50	3105	53 18 46	3103	51 50 39	3101	50 22 31	3099
	SUN	E.	75 40 34	3454	74 19 18	3450	72 57 59	3446	71 36 35	3442
6	Aldebaran	W.	92 4 32	3043	93 33 52	3036	95 3 20	3029	96 32 57	3022
	Pollux	W.	47 54 0	3043	49 23 20	3035	50 52 50	3027	52 22 29	3019
	Spica	E.	43 0 59	3084	41 32 30	3080	40 3 56	3077	38 35 19	3073
	SUN	E.	64 48 10	3412	63 26 7	3405	62 3 57	3398	60 41 38	3390
7	Aldebaran	W.	104 3 28	2980	105 34 6	2970	107 4 56	2960	108 35 59	2950
	Pollux	W.	59 53 23	2973	61 24 9	2963	62 55 7	2954	64 26 17	2943
	Regulus	W.	24 3 30	3041	25 32 52	3022	27 2 38	3007	28 32 42	2992
	Spica	E.	31 11 21	3064	29 42 27	3065	28 13 34	3066	26 44 41	3067
	SUN	E.	53 47 34	3344	52 24 13	3334	51 0 39	3323	49 36 54	3311
8	Aldebaran	W.	116 14 24	2898	117 46 46	2887	119 19 22	2876	120 52 13	2865
	Pollux	W.	72 5 36	2887	73 38 11	2875	75 11 2	2863	76 44 8	2851
	Regulus	W.	36 7 54	2916	37 39 53	2901	39 12 10	2888	40 44 44	2873
	SUN	E.	42 34 50	3253	41 9 43	3241	39 44 22	3228	38 18 46	3216
9	Pollux	W.	84 33 35	2788	86 8 18	2776	87 43 17	2763	89 18 33	2750
	Regulus	W.	48 32 7	2805	50 6 29	2791	51 41 10	2777	53 16 8	2764
	SUN	E.	31 7 2	3153	29 39 56	3140	28 12 34	3127	26 44 57	3115
10	Pollux	W.	97 19 9	2687	98 56 7	2674	100 33 23	2661	102 10 55	2649
	Regulus	W.	61 15 31	2695	62 52 17	2682	64 29 21	2669	66 6 42	2656
	SUN	E.	19 23 14	3056	17 54 14	3044	16 25 2	3033	14 55 38	3020

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^h.	P. L. of Diff.	VI^h.	P. L of Diff.	IX^h.	P. L. of Diff.
14	Sun	W.	24° 18′ 14″	2731	25° 54′ 13″	2722	27° 30′ 26″	2713	29° 6′ 49″	2704
	Jupiter	E.	50 35 7	2318	48 49 34	2313	47 3 54	2309	45 18 8	2306
	Fomalhaut	E.	76 49 26	2569	75 9 48	2564	73 30 4	2561	71 50 16	2559
	α Pegasi	E.	95 17 44	2802	93 43 19	2794	92 8 43	2787	90 33 58	2780
15	Sun	W.	37 11 17	2671	38 48 36	2666	40 26 2	2660	42 3 35	2656
	Jupiter	E.	36 28 3	2291	34 41 51	2290	32 55 37	2289	31 9 22	2289
	Fomalhaut	E.	63 30 47	2559	61 50 56	2562	60 11 9	2565	58 31 26	2570
	α Pegasi	E.	82 38 29	2763	81 3 13	2762	79 27 55	2763	77 52 39	2765
16	Sun	W.	50 12 49	2636	51 50 55	2632	53 29 4	2630	55 7 17	2628
	Venus	W.	24 46 10	2326	26 31 31	2316	28 17 7	2307	30 2 56	2299
	Fomalhaut	E.	50 15 14	2617	48 36 42	2631	46 58 29	2648	45 20 39	2668
	α Pegasi	E.	69 57 23	2792	68 22 44	2801	66 48 18	2812	65 14 6	2825
	α Arietis	E.	111 58 13	2445	110 15 43	2440	108 33 4	2435	106 50 19	2430
17	Sun	W.	63 19 6	2620	64 57 35	2619	66 36 5	2618	68 14 36	2617
	Venus	W.	38 54 38	2269	40 41 23	2264	42 28 15	2260	44 15 13	2256
	Fomalhaut	E.	37 19 28	2820	35 45 26	2865	34 12 22	2919	32 40 27	2981
	α Pegasi	E.	57 27 56	2916	55 55 58	2942	54 24 33	2972	52 53 44	3004
	α Arietis	E.	98 15 9	2415	96 31 56	2413	94 48 40	2411	93 5 21	2410
18	Sun	W.	76 27 23	2615	78 5 57	2616	79 44 31	2617	81 23 4	2617
	Venus	W.	53 11 12	2243	54 58 35	2241	56 46 2	2239	58 33 32	2237
	α Arietis	E.	84 28 40	2411	82 45 21	2412	81 2 4	2414	79 18 49	2416
	Aldebaran	E.	115 2 15	2312	113 16 32	2312	111 30 50	2312	109 45 7	2319
19	Sun	W.	89 35 36	2621	91 14 3	2623	92 52 28	2624	94 30 51	2625
	Venus	W.	67 31 32	2231	69 19 13	2230	71 6 55	2230	72 54 38	2229
	Jupiter	W.	21 8 39	2302	22 54 36	2296	24 40 41	2293	26 26 51	2289
	α Arietis	E.	70 43 27	2431	69 0 36	2436	67 17 52	2441	65 35 15	2446
	Aldebaran	E.	100 56 40	2315	99 11 2	2316	97 25 25	2317	95 39 50	2318
20	Sun	W.	102 42 14	2635	104 20 22	2637	105 58 28	2638	107 36 31	2641
	Venus	W.	81 53 21	2229	83 41 6	2229	85 28 50	2229	87 16 34	2230
	α Aquilæ	W.	52 8 39	3678	53 25 49	3619	54 44 3	3565	56 3 15	3515
	Jupiter	W.	35 18 32	2283	37 4 56	2283	38 51 21	2283	40 37 46	2283
	α Arietis	E.	57 4 20	2482	55 22 41	2492	53 41 16	2502	52 0 5	2513
	Aldebaran	E.	86 52 27	2326	85 7 6	2328	83 21 49	2330	81 36 35	2333
21	Sun	W.	115 45 49	2655	117 23 29	2658	119 1 5	2662	120 38 35	2666
	Venus	W.	96 14 56	2235	98 2 33	2237	99 50 6	2238	101 37 37	2240
	α Aquilæ	W.	62 51 20	3334	64 14 52	3307	65 38 55	3283	67 3 26	3263
	Jupiter	W.	49 29 30	2289	51 15 45	2291	53 1 58	2292	54 48 9	2294
	α Arietis	E.	43 38 46	2592	41 59 40	2613	40 21 3	2637	38 42 58	2665
	Aldebaran	E.	72 51 21	2348	71 6 32	2351	69 21 47	2355	67 37 8	2359
22	α Aquilæ	W.	74 11 15	3192	75 37 34	3183	77 4 4	3176	78 30 42	3171
	Jupiter	W.	63 38 21	2304	65 24 14	2307	67 10 3	2310	68 55 48	2312
	Fomalhaut	W.	39 12 54	2800	40 47 22	2775	42 22 23	2753	43 57 52	2734
	Aldebaran	E.	58 55 22	2382	57 11 21	2387	55 27 28	2393	53 43 42	2399
	Pollux	E.	103 3 49	2368	101 19 29	2373	99 35 15	2378	97 51 8	2383

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LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
14	Sun	W.	30° 43′ 24″	2696	32° 20′ 9″	2690	33° 57′ 3″	2684	35° 34′ 5″	2678
	Jupiter	E.	43 32 17	2302	41 46 20	2298	40 0 18	2296	38 14 11	2294
	Fomalhaut	E.	70 10 25	2557	68 30 31	2556	66 50 36	2556	65 10 41	2557
	α Pegasi	E.	88 59 4	2775	87 24 3	2770	85 48 56	2766	84 13 44	2764
15	Sun	W.	43 41 15	2652	45 19 0	2648	46 56 52	2644	48 34 48	2640
	Jupiter	E.	29 23 6	2290	27 36 54	2292	25 50 42	2294	24 4 34	2298
	Fomalhaut	E.	56 51 51	2577	55 12 25	2584	53 33 8	2593	51 54 4	2604
	α Pegasi	E.	76 17 25	2768	74 42 15	2772	73 7 10	2778	71 32 13	2784
16	Sun	W.	56 45 34	2626	58 23 53	2624	60 2 15	2623	61 40 39	2621
	Venus	W.	31 48 56	2292	33 35 8	2285	35 21 30	2279	37 8 0	2274
	Fomalhaut	E.	43 43 16	2690	42 6 23	2714	40 30 4	2744	38 54 23	2780
	α Pegasi	E.	63 40 10	2839	62 6 32	2855	60 33 16	2873	59 0 23	2894
	α Arietis	E.	105 7 27	2426	103 24 29	2422	101 41 27	2419	99 58 20	2417
17	Sun	W.	69 53 8	2616	71 31 41	2615	73 10 15	2615	74 48 49	2615
	Venus	W.	46 2 15	2253	47 49 23	2250	49 36 35	2248	51 23 51	2245
	Fomalhaut	E.	31 9 50	3056	29 40 46	3143	28 13 29	3247	26 48 15	3372
	α Pegasi	E.	51 23 36	3039	49 54 11	3078	48 25 35	3122	46 57 52	3173
	α Arietis	E.	91 22 2	2410	89 38 41	2411	87 55 21	2410	86 12 0	2410
18	Sun	W.	83 1 36	2617	84 40 8	2618	86 18 38	2619	87 57 8	2620
	Venus	W.	60 21 3	2236	62 8 38	2234	63 56 14	2233	65 43 52	2232
	α Arietis	E.	77 35 37	2418	75 52 28	2421	74 9 23	2424	72 26 22	2428
	Aldebaran	E.	107 59 25	2311	106 13 42	2312	104 28 1	2313	102 42 20	2314
19	Sun	W.	96 9 12	2626	97 47 32	2628	99 25 48	2630	101 4 2	2632
	Venus	W.	74 42 22	2229	76 30 7	2229	78 17 52	2229	80 5 37	2229
	Jupiter	W.	28 13 5	2286	29 59 23	2285	31 45 45	2284	33 32 8	2283
	α Arietis	E.	63 52 46	2452	62 10 25	2458	60 28 13	2465	58 46 11	2473
	Aldebaran	E.	93 54 17	2320	92 8 46	2321	90 23 17	2323	88 37 51	2324
20	Sun	W.	109 14 30	2644	110 52 25	2647	112 30 17	2650	114 8 5	2652
	Venus	W.	89 4 17	2230	90 51 59	2231	92 39 40	2232	94 27 19	2233
	α Aquilæ	W.	57 23 22	3471	58 44 18	3431	60 5 59	3395	61 28 21	3363
	Jupiter	W.	42 24 9	2284	44 10 31	2285	45 56 53	2287	47 43 12	2288
	α Arietis	E.	50 19 10	2526	48 38 33	2540	46 58 15	2556	45 18 19	2572
	Aldebaran	E.	79 51 24	2336	78 6 17	2339	76 21 14	2342	74 36 15	2345
21	Sun	W.	122 16 0	2670	123 53 20	2674	125 30 35	2678	127 7 45	2683
	Venus	W.	103 25 5	2242	105 12 31	2244	106 59 53	2246	108 47 12	2248
	α Aquilæ	W.	68 28 21	3244	69 53 38	3228	71 19 14	3214	72 45 7	3201
	Jupiter	W.	56 34 17	2296	58 20 23	2298	60 6 25	2300	61 52 25	2302
	α Arietis	E.	37 5 31	2695	35 28 45	2731	33 52 46	2769	32 17 38	2818
	Aldebaran	E.	65 52 35	2363	64 8 7	2367	62 23 45	2372	60 39 30	2377
22	α Aquilæ	W.	79 57 27	3168	81 24 15	3165	82 51 6	3164	84 17 58	3166
	Jupiter	W.	70 41 30	2314	72 27 9	2317	74 12 43	2320	75 58 14	2322
	Fomalhaut	W.	45 33 47	2719	47 10 2	2706	48 46 36	2693	50 23 25	2684
	Aldebaran	E.	52 0 5	2405	50 16 37	2412	48 33 18	2419	46 50 9	2426
	Pollux	E.	96 7 7	2387	94 23 14	2392	92 39 28	2397	90 55 49	2403

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23	α Aquilæ	W.	85° 44′ 48″	3168	87° 11′ 36″	3172	88° 38′ 19″	3176	90° 4′ 55″	3183
	Jupiter	W.	77 43 41	2326	79 29 3	2329	81 14 21	2332	82 59 34	2334
	Fomalhaut	W.	52 0 26	2677	53 37 36	2671	55 14 54	2666	56 52 20	2662
	α Pegasi	W.	38 32 53	3640	39 50 44	3559	41 10 3	3488	42 30 41	3426
	Aldebaran	E.	45 7 10	2433	43 24 22	2442	41 41 46	2451	39 59 22	2460
	Pollux	E.	89 12 19	2408	87 28 56	2415	85 45 42	2422	84 2 38	2429
24	Jupiter	W.	91 44 41	2348	93 29 30	2351	95 14 16	2354	96 58 57	2356
	Fomalhaut	W.	65 0 5	2662	66 37 36	2664	68 15 3	2668	69 52 26	2672
	α Pegasi	W.	49 28 53	3212	50 54 47	3184	52 21 16	3160	53 48 13	3138
	Pollux	E.	75 29 39	2463	73 47 34	2471	72 5 41	2480	70 23 59	2488
	Regulus	E.	111 33 57	2471	109 52 3	2478	108 10 20	2486	106 28 47	2494
25	Fomalhaut	W.	77 57 44	2702	79 34 21	2710	81 10 49	2717	82 47 6	2736
	α Pegasi	W.	61 8 16	3073	62 36 59	3065	64 5 51	3060	65 34 49	3057
	Pollux	E.	61 58 35	2534	60 18 9	2544	58 37 57	2554	56 57 59	2564
	Regulus	E.	98 3 57	2538	96 23 36	2547	94 43 29	2557	93 3 34	2567
	Saturn	E.	116 2 33	2552	114 22 31	2561	112 42 42	2570	111 3 6	2580
26	Fomalhaut	W.	90 45 28	2776	92 20 27	2787	93 55 12	2799	95 29 41	2812
	α Pegasi	W.	73 0 12	3059	74 29 12	3063	75 58 7	3067	77 26 57	3073
	α Arietis	W.	29 23 25	3110	30 51 23	3075	32 20 3	3047	33 49 18	3024
	Pollux	E.	48 41 47	2620	47 3 19	2631	45 25 6	2643	43 47 10	2655
	Regulus	E.	84 47 31	2620	83 9 3	2631	81 30 48	2642	79 52 50	2653
	Saturn	E.	102 48 32	2632	101 10 20	2643	99 32 22	2654	97 54 39	2665
27	Fomalhaut	W.	103 18 0	2878	104 50 47	2893	106 23 16	2908	107 55 25	2924
	α Pegasi	W.	84 49 1	3114	86 16 54	3124	87 44 35	3134	89 12 3	3146
	α Arietis	W.	41 21 2	2964	42 51 59	2960	44 23 2	2958	45 54 7	2958
	Pollux	E.	35 41 43	2720	34 5 30	2734	32 29 36	2748	30 54 0	2763
	Regulus	E.	71 46 49	2712	70 10 25	2724	68 34 17	2736	66 58 24	2748
	Saturn	E.	89 49 53	2722	88 13 42	2733	86 37 47	2745	85 2 7	2757
28	α Pegasi	W.	96 25 40	3913	97 51 34	3928	99 17 10	3943	100 42 28	3959
	α Arietis	W.	53 29 17	2970	55 0 7	2975	56 30 51	2980	58 1 27	2986
	Aldebaran	W.	22 2 29	2896	23 34 53	2896	25 7 18	2898	26 39 39	2901
	Regulus	E.	59 3 7	2810	57 28 52	2822	55 54 53	2835	54 21 11	2848
	Saturn	E.	77 7 41	2817	75 33 38	2828	73 59 47	2840	72 26 12	2852
	Spica	E.	113 5 6	2821	111 31 5	2832	109 57 18	2843	108 23 46	2854
29	α Arietis	W.	65 32 28	3022	67 2 14	3029	68 31 49	3037	70 1 15	3045
	Aldebaran	W.	34 20 2	2930	35 51 43	2938	37 23 14	2945	38 54 36	2954
	Regulus	E.	46 36 40	2909	45 4 32	2921	43 32 40	2933	42 1 5	2946
	Saturn	E.	64 42 0	2910	63 9 54	2920	61 38 1	2931	60 6 23	2942
	Spica	E.	100 39 38	2909	99 7 30	2920	97 35 36	2930	96 3 55	2940
30	α Arietis	W.	77 25 58	3085	78 54 26	3093	80 22 44	3101	81 50 53	3109
	Aldebaran	W.	46 28 55	2993	47 59 16	3000	49 29 29	3008	50 59 32	3015
	Regulus	E.	34 27 5	3009	32 57 4	3022	31 27 20	3035	29 57 51	3049
	Saturn	E.	52 31 29	2993	51 1 8	3003	49 30 59	3012	48 1 1	3021
	Spica	E.	88 28 42	2989	86 58 15	2998	85 28 0	3007	83 57 56	3016
	Sun	E.	134 13 24	3341	132 50 0	3351	131 26 48	3361	130 3 47	3370

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Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
23	α Aquilæ	W.	91° 31′ 25″	3191	92° 57′ 45″	3201	94° 23′ 53″	3211	95° 49′ 49″	3223
	JUPITER	W.	84 44 44	2337	86 29 50	2341	88 14 51	2343	89 59 48	2346
	Fomalhaut	W.	58 29 51	2660	60 7 23	2659	61 44 58	2660	63 22 32	2660
	α Pegasi	W.	43 52 28	3372	45 15 18	3324	46 39 2	3281	48 3 36	3244
	Aldebaran	E.	38 17 11	2469	36 35 14	2479	34 53 31	2490	33 12 4	2502
	Pollux	E.	82 19 42	2434	80 36 56	2441	78 54 20	2448	77 11 54	2456
24	JUPITER	W.	98 43 35	2358	100 28 10	2360	102 12 42	2362	103 57 12	2363
	Fomalhaut	W.	71 29 44	2676	73 6 55	2681	74 44 0	2658	76 20 56	2694
	α Pegasi	W.	55 15 36	3120	56 43 21	3105	58 11 24	3092	59 39 43	3081
	Pollux	E.	68 42 30	2496	67 1 11	2505	65 20 6	2515	63 39 13	2525
	Regulus	E.	104 47 25	2502	103 6 15	2511	101 25 17	2520	99 44 30	2529
25	Fomalhaut	W.	84 23 12	2735	85 59 5	2744	87 34 46	2754	89 10 14	2765
	α Pegasi	W.	67 3 51	3055	68 32 56	3053	70 2 3	3054	71 31 8	3056
	Pollux	E.	55 18 14	2575	53 38 45	2586	51 59 30	2597	50 20 31	2608
	Regulus	E.	91 23 53	2577	89 44 26	2587	88 5 13	2598	86 26 14	2609
	SATURN	E.	109 23 44	2590	107 44 35	2600	106 5 40	2610	104 26 59	2621
26	Fomalhaut	W.	97 3 54	2824	98 37 51	2837	100 11 31	2850	101 44 54	2864
	α Pegasi	W.	78 55 40	3080	80 24 14	3087	81 52 40	3095	83 20 56	3104
	α Arietis	W.	35 19 1	3005	36 49 8	2990	38 19 33	2978	39 50 13	2970
	Pollux	E.	42 9 31	2668	40 32 8	2681	38 55 2	2694	37 18 14	2707
	Regulus	E.	78 15 6	2665	76 37 39	2676	75 0 26	2688	73 23 30	2700
	SATURN	E.	96 17 11	2676	94 39 59	2687	93 3 2	2698	91 26 20	2710
27	Fomalhaut	W.	109 27 16	2939	110 58 46	2954	112 29 56	2971	114 0 45	2987
	α Pegasi	W.	90 39 17	3158	92 6 16	3171	93 33 0	3184	94 59 28	3198
	α Arietis	W.	47 25 13	2958	48 56 18	2959	50 27 22	2961	51 58 22	2966
	Pollux	E.	29 18 45	2779	27 43 49	2795	26 9 14	2811	24 35 0	2828
	Regulus	E.	65 22 48	2761	63 47 29	2773	62 12 25	2785	60 37 38	2797
	SATURN	E.	83 26 43	2769	81 51 35	2781	80 16 42	2793	78 42 5	2805
28	α Pegasi	W.	102 7 27	3277	103 32 7	3294	104 56 26	3312	106 20 25	3330
	α Arietis	W.	59 31 57	2993	61 2 18	3000	62 32 30	3007	64 2 34	3014
	Aldebaran	W.	28 11 56	2905	29 44 8	2910	31 16 14	2916	32 48 12	2923
	Regulus	E.	52 47 44	2861	51 14 35	2873	49 41 40	2885	48 9 2	2897
	SATURN	E.	70 52 52	2864	69 19 47	2875	67 46 56	2886	66 14 21	2898
	Spica	E.	106 50 28	2865	105 17 24	2876	103 44 35	2887	102 11 59	2698
29	α Arietis	W.	71 30 31	3053	72 59 38	3061	74 28 34	3069	75 57 21	3077
	Aldebaran	W.	40 25 47	2961	41 56 49	2969	43 27 41	2977	44 58 23	2985
	Regulus	E.	40 29 46	2959	38 58 42	2971	37 27 54	2983	35 57 22	2996
	SATURN	E.	58 34 58	2953	57 3 46	2963	55 32 48	2973	54 2 2	2983
	Spica	E.	94 32 27	2950	93 1 12	2960	91 30 10	2970	89 59 20	2980
30	α Arietis	W.	83 18 52	3116	84 46 42	3123	86 14 24	3130	87 41 57	3137
	Aldebaran	W.	52 29 26	3022	53 59 11	3028	55 28 48	3035	56 58 17	3041
	Regulus	E.	28 28 39	3065	26 59 46	3079	25 31 11	3094	24 2 54	3110
	SATURN	E.	46 31 15	3030	45 1 40	3039	43 32 15	3047	42 3 1	3055
	Spica	E.	82 28 3	3024	80 58 20	3032	79 28 47	3040	77 59 23	3047
	SUN	E.	128 40 56	3379	127 18 15	3387	125 55 44	3395	124 33 22	3403

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Mon.	1	16 30 22.27	10.802	S. 21 51 20.4	−23.07	16 15.99	70.32	10 46.58	0.944
Tues.	2	16 34 41.86	10.830	22 0 21.8	22.02	16 16.13	70.40	10 23.61	0.971
Wed.	3	16 39 2.09	10.856	22 8 57.8	20.96	16 16.27	70.48	10 0.00	0.997
Thur.	4	16 43 22.94	10.881	22 17 8.1	−19.89	16 16.40	70.56	9 35.77	1.022
Frid.	5	16 47 44.38	10.905	22 24 52.5	18.80	16 16.53	70.64	9 10.96	1.046
Sat.	6	16 52 6.38	10.928	22 32 10.8	17.71	16 16.66	70.71	8 45.58	1.069
SUN.	7	16 56 28.93	10.949	22 39 2.7	−16.60	16 16.78	70.78	8 19.66	1.090
Mon.	8	17 0 51.99	10.970	22 45 28.0	15.49	16 16.90	70.84	7 53.23	1.111
Tues.	9	17 5 15.53	10.989	22 51 26.5	14.37	16 17.01	70.90	7 26.33	1.130
Wed.	10	17 9 39.51	11.007	22 56 57.9	−13.24	16 17.12	70.96	6 58.99	1.148
Thur.	11	17 14 3.90	11.023	23 2 2.0	12.10	16 17.23	71.01	6 31.24	1.164
Frid.	12	17 18 28.66	11.038	23 6 38.7	10.95	16 17.33	71.06	6 3.11	1.179
Sat.	13	17 22 53.76	11.051	23 10 47.8	− 9.80	16 17.43	71.11	5 34.63	1.192
SUN.	14	17 27 19.17	11.064	23 14 29.2	8.65	16 17.53	71.15	5 5.85	1.205
Mon.	15	17 31 44.86	11.074	23 17 42.7	7.49	16 17.62	71.18	4 36.81	1.215
Tues.	16	17 36 10.78	11.083	23 20 28.2	− 6.32	16 17.71	71.21	4 7.53	1.224
Wed.	17	17 40 36.89	11.091	23 22 45.6	5.14	16 17.80	71.24	3 38.06	1.231
Thur.	18	17 45 3.16	11.098	23 24 34.9	3.96	16 17.88	71.26	3 8.43	1.238
Frid.	19	17 49 29.55	11.102	23 25 55.9	− 2.78	16 17.96	71.28	2 38.67	1.242
Sat.	20	17 53 56.04	11.105	23 26 48.6	1.60	16 18.03	71.29	2 8.82	1.245
SUN.	21	17 58 22.58	11.106	23 27 13.0	− 0.42	16 18.09	71.30	1 38.92	1.246
Mon.	22	18 2 49.15	11.107	23 27 9.1	+ 0.75	16 18.15	71.30	1 9.00	1.247
Tues.	23	18 7 15.69	11.106	23 26 36.9	1.93	16 18.20	71.30	0 39.10	1.246
Wed.	24	18 11 42.20	11.104	23 25 36.4	3.11	16 18.25	71.29	0 9.23	1.244
Thur.	25	18 16 8.66	11.100	23 24 7.6	+ 4.29	16 18.29	71.28	0 20.59	1.240
Frid.	26	18 20 35.02	11.096	23 22 10.6	5.46	16 18.33	71.27	0 50.32	1.236
Sat.	27	18 25 1.24	11.090	23 19 45.4	6.63	16 18.36	71.25	1 19.91	1.230
SUN.	28	18 29 27.30	11.083	23 16 52.1	+ 7.80	16 18.38	71.23	1 49.33	1.223
Mon.	29	18 33 53.18	11.074	23 13 30.8	8.97	16 18.40	71.20	2 18.56	1.214
Tues.	30	18 38 18.84	11.064	23 9 41.7	10.13	16 18.41	71.17	2 47.58	1.204
Wed.	31	18 42 44.25	11.053	23 5 24.8	11.29	16 18.41	71.13	3 16.36	1.193
Thur.	32	18 47 9.38	11.041	S. 23 0 40.2	+12.44	16 18.41	71.09	3 44.85	1.181

NOTE.—The mean time of semidiameter passing may be found by subtracting $0^s.19$ from the sidereal time.
The sign — prefixed to the hourly change of declination indicates that south declinations are increasing; the sign + indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	Equation of Time, to be Added to / Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Mon.	1	16 30 24.21	10.800	S. 21 51 24.6	−23.06	10 46.41	0.944	16 41 10.62
Tues.	2	16 34 43.74	10.827	22 0 25.6	22.01	10 23.44	0.971	16 45 7.18
Wed.	3	16 39 3.90	10.853	22 9 1.3	20.95	9 59.83	0.997	16 49 3.73
Thur.	4	16 43 24.68	10.878	22 17 11.3	−19.88	9 35.61	1.022	16 53 0.29
Frid.	5	16 47 46.05	10.902	22 24 55.4	18.79	9 10.80	1.046	16 56 56.84
Sat.	6	16 52 7.98	10.925	22 32 13.4	17.70	8 45.43	1.069	17 0 53.41
SUN.	7	16 56 30.45	10.946	22 39 5.1	−16.59	8 19.51	1.090	17 4 49.96
Mon.	8	17 0 53.43	10.967	22 45 30.1	15.48	7 53.09	1.111	17 8 46.52
Tues.	9	17 5 16.89	10.986	22 51 28.3	14.36	7 26.19	1.130	17 12 43.08
Wed.	10	17 9 40.79	11.004	22 56 59.5	−13.23	6 58.85	1.148	17 16 39.64
Thur.	11	17 14 5.09	11.020	23 2 3.4	12.09	6 31.11	1.164	17 20 36.20
Frid.	12	17 18 29.77	11.035	23 6 39.9	10.94	6 2.99	1.179	17 24 32.76
Sat.	13	17 22 54.79	11.048	23 10 48.8	− 9.79	5 34.52	1.192	17 28 29.31
SUN.	14	17 27 20.12	11.061	23 14 30.0	8.64	5 5.75	1.205	17 32 25.87
Mon.	15	17 31 45.71	11.071	23 17 43.3	7.48	4 36.72	1.215	17 36 22.43
Tues.	16	17 36 11.54	11.080	23 20 28.7	− 6.31	4 7.45	1.224	17 40 18.99
Wed.	17	17 40 37.56	11.087	23 22 46.0	5.14	3 37.99	1.231	17 44 15.55
Thur.	18	17 45 3.74	11.094	23 24 35.1	3.96	3 8.37	1.238	17 48 12.11
Frid.	19	17 49 30.04	11.098	23 25 56.0	− 2.78	2 38.62	1.242	17 52 8.66
Sat.	20	17 53 56.44	11.101	23 26 48.7	1.60	2 8.78	1.245	17 56 5.22
SUN.	21	17 58 22.89	11.102	23 27 13.1	− 0.42	1 38.89	1.246	18 0 1.78
Mon.	22	18 2 49.36	11.103	23 27 9.1	+ 0.75	1 8.98	1.247	18 3 58.34
Tues.	23	18 7 15.81	11.102	23 26 36.9	1.93	0 39.09	1.246	18 7 54.90
Wed.	24	18 11 42.23	11.100	23 25 36.4	3.11	0 9.23	1.244	18 11 51.46
Thur.	25	18 16 8.60	11.096	23 24 7.6	+ 4.29	0 20.58	1.240	18 15 48.01
Frid.	26	18 20 34.87	11.092	23 22 10.7	5.46	0 50.30	1.236	18 19 44.57
Sat.	27	18 25 1.00	11.086	23 19 45.6	6.63	1 19.87	1.230	18 23 41.13
SUN.	28	18 29 26.97	11.079	23 16 52.4	+ 7.80	1 49.28	1.223	18 27 37.69
Mon.	29	18 33 52.76	11.070	23 13 31.3	8.97	2 18.51	1.214	18 31 34.25
Tues.	30	18 38 18.33	11.060	23 9 42.2	10.13	2 47.52	1.204	18 35 30.81
Wed.	31	18 42 43.65	11.049	23 5 25.4	11.28	3 16.29	1.193	18 39 27.36
Thur.	32	18 47 8.69	11.037	S. 23 0 40.9	+12.43	3 44.77	1.181	18 43 23.92

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign − prefixed to the hourly change of declination indicates that south declinations are increasing; the sign + indicates that south declinations are decreasing.

Diff. for 1 hour, + 9s.8565. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ′	THE SUN'S Diff. for 1 Hour.	THE SUN'S LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	335	249 17 38.9	17 10.3	152.11	+ 0.31	9.9937303	−27.0	7 17 37.49
2	336	250 18 30.4	18 1.6	152.17	0.38	9.9936667	26.1	7 13 41.58
3	337	251 19 23.2	18 54.2	152.23	0.43	9.9936052	25.2	7 9 45.67
4	338	252 20 17.4	19 48.2	152.29	+ 0.45	9.9935457	−24.4	7 5 49.76
5	339	253 21 13.0	20 43.6	152.34	0.43	9.9934882	23.6	7 1 53.84
6	340	254 22 9.8	21 40.3	152.40	0.38	9.9934325	22.8	6 57 57.93
7	341	255 23 7.9	22 38.2	152.45	+ 0.31	9.9933786	−22.1	6 54 2.02
8	342	256 24 7.2	23 37.3	152.50	0.22	9.9933263	21.5	6 50 6.11
9	343	257 25 7.6	24 37.5	152.54	+ 0.10	9.9932756	20.8	6 46 10.19
10	344	258 26 9.0	25 38.7	152.58	− 0.03	9.9932265	−20.2	6 42 14.28
11	345	259 27 11.3	26 40.8	152.62	0.16	9.9931789	19.6	6 38 18.37
12	346	260 28 14.4	27 43.8	152.65	0.29	9.9931326	19.0	6 34 22.46
13	347	261 29 18.2	28 47.4	152.67	− 0.41	9.9930878	−18.4	6 30 26.54
14	348	262 30 22.6	29 51.6	152.69	0.52	9.9930446	17.7	6 26 30.63
15	349	263 31 27.6	30 56.4	152.71	0.60	9.9930031	16.9	6 22 34.72
16	350	264 32 33.0	32 1.7	152.73	− 0.66	9.9929633	−16.1	6 18 38.81
17	351	265 33 38.8	33 7.3	152.74	0.69	9.9929254	15.3	6 14 42.89
18	352	266 34 44.9	34 13.2	152.75	0.69	9.9928894	14.5	6 10 46.98
19	353	267 35 51.2	35 19.3	152.76	− 0.66	9.9928555	−13.6	6 6 51.07
20	354	268 36 57.7	36 25.6	152.77	0.60	9.9928238	12.7	6 2 55.16
21	355	269 38 4.5	37 32.2	152.78	0.51	9.9927944	11.7	5 58 59.24
22	356	270 39 11.4	38 38.9	152.79	− 0.39	9.9927675	−10.7	5 55 3.33
23	357	271 40 18.4	39 45.7	152.80	0.26	9.9927433	9.6	5 51 7.42
24	358	272 41 25.5	40 52.7	152.81	− 0.13	9.9927219	8.4	5 47 11.51
25	359	273 42 33.0	41 59.9	152.82	0.00	9.9927032	− 7.3	5 43 15.59
26	360	274 43 40.7	43 7.4	152.83	+ 0.14	9.9926873	6.1	5 39 19.68
27	361	275 44 48 6	44 15.1	152.84	0.26	9.9926742	4.9	5 35 23.77
28	362	276 45 56.7	45 23.0	152.85	+ 0.36	9.9926639	− 3.7	5 31 27.86
29	363	277 47 5.1	46 31.2	152.86	0.44	9.9926568	2.5	5 27 31.94
30	364	278 48 13.8	47 39.8	152.87	0.49	9.9926522	1.4	5 23 36.03
31	365	279 49 22.9	48 48.7	152.88	0.51	9.9926502	− 0.3	5 19 40.12
32	366	280 50 32.3	49 57.9	152.90	+ 0.49	9.9926508	+ 0.8	5 15 44.21

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January $0^d.0$.

Diff. for 1 Hour,
— $9^s.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 52.0	14 50.0	54 26.9	−0.71	54 19.5	−0.52	16 28.4	1.95	18.9
2	14 48.6	14 47.9	54 14.5	−0.32	54 11.9	−0.11	17 13.9	1.85	19.9
3	14 47.9	14 48.6	54 11.8	+0.11	54 14.4	+0.33	17 57.3	1.77	20.9
4	14 50.0	14 52.2	54 19.7	+0.55	54 27.5	+0.77	18 39.1	1.73	21.9
5	14 55.0	14 58.6	54 38.0	0.99	54 51.0	1.19	19 20.5	1.73	22.9
6	15 2.7	15 7.5	55 6.3	1.38	55 23.9	1.55	20 2.3	1.77	23.9
7	15 12.8	15 18.6	55 43.4	+1.70	56 4.6	+1.82	20 45.7	1.87	24.9
8	15 24.7	15 31.1	56 27.0	1.91	56 50.4	1.97	21 31.9	2.00	25.9
9	15 37.6	15 44.1	57 14.3	1.99	57 38.2	1.97	22 21.9	2.18	26.9
10	15 50.4	15 56.5	58 1.5	+1.91	58 23.8	+1.80	23 16.5	2.36	27.9
11	16 2.2	16 7.3	58 44.6	1.66	59 3.5	1.48	☌		28.9
12	16 11.8	16 15.6	59 20.0	1.27	59 33.8	1.03	0 15.5	2.52	0.4
13	16 18.5	16 20.6	59 44.7	+0.78	59 52.4	+0.52	1 17.5	2.60	1.4
14	16 21.9	16 22.3	59 57.1	+0.27	59 58.7	+0.02	2 20.2	2.57	2.4
15	16 22.0	16 20.9	59 57.4	−0.23	59 53.4	−0.44	3 21.1	2.46	3.4
16	16 19.1	16 16.9	59 47.0	−0.62	59 38.6	−0.78	4 18.5	2.31	4.4
17	16 14.1	16 10.9	59 28.4	0.91	59 16.8	1.01	5 12.1	2.16	5.4
18	16 7.5	16 3.8	59 4.2	1.09	58 50.8	1.15	6 2.4	2.05	6.4
19	16 0.0	15 56.1	58 36.7	−1.19	58 22.3	−1.21	6 50.4	1.98	7.4
20	15 52.1	15 48.2	58 7.7	1.23	57 52.9	1.24	7 37.5	1.97	8.4
21	15 44.1	15 40.0	57 38.1	1.24	57 23.3	1.24	8 24.9	1.99	9.4
22	15 36.0	15 32.0	57 8.5	−1.23	56 53.8	−1.22	9 13.3	2.05	10.4
23	15 28.0	15 24.1	56 39.2	1.21	56 24.7	1.21	10 3.3	2.12	11.4
24	15 20.1	15 16.3	56 10.2	1.20	55 56.0	1.18	10 55.1	2.18	12.4
25	15 12.5	15 8.8	55 42.1	−1.16	55 28.5	−1.12	11 47.9	2.20	13.4
26	15 5.2	15 1.8	55 15.4	1.07	55 2.9	1.01	12 40.7	2.17	14.4
27	14 58.6	14 55.6	54 51.1	0.94	54 40.2	0.86	13 32.2	2.10	15.4
28	14 53.0	14 50.7	54 30.5	−0.76	54 22.1	−0.65	14 21.5	2.00	16.4
29	14 48.8	14 47.4	54 15.1	0.52	54 9.9	0.37	15 8.2	1.89	17.4
30	14 46.4	14 46.0	54 6.4	−0.21	54 5.0	−0.03	15 52.3	1.80	18.4
31	14 46.2	14 47.0	54 5.7	+0.16	54 8.7	+0.36	16 34.5	1.73	19.4
32	14 48.5	14 50.7	54 14.2	+0.57	54 22.2	+0.78	17 15.4	1.70	20.4

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 1.					WEDNESDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	8 37 57.49	2.1199	N.22 46 52.9	5.911	0	10 15 2.65	1.9329	N.16 19 44.3	9.933
1	8 40 4.56	2.1158	22 40 55.2	6.012	1	10 16 58.53	1.9298	16 9 46.3	9.998
2	8 42 11.39	2.1117	22 34 51.4	6.113	2	10 18 54.22	1.9266	15 59 44.5	10.063
3	8 44 17.97	2.1076	22 28 41.6	6.213	3	10 20 49.72	1.9235	15 49 38.8	10.128
4	8 46 24.30	2.1034	22 22 25.8	6.313	4	10 22 45.04	1.9204	15 39 29.2	10.192
5	8 48 30.38	2.0991	22 16 4.0	6.412	5	10 24 40.17	1.9173	15 29 15.8	10.255
6	8 50 36.20	2.0949	22 9 36.3	6.510	6	10 26 35.12	1.9144	15 18 58.6	10.317
7	8 52 41.77	2.0908	22 3 2.8	6.607	7	10 28 29.90	1.9115	15 8 37.7	10.379
8	8 54 47.10	2.0866	21 56 23.5	6.702	8	10 30 24.50	1.9086	14 58 13.1	10.440
9	8 56 52.17	2.0824	21 49 38.5	6.797	9	10 32 18.93	1.9057	14 47 44.9	10.501
10	8 58 56.99	2.0782	21 42 47.8	6.892	10	10 34 13.19	1.9030	14 37 13.0	10.562
11	9 1 1.56	2.0740	21 35 51.4	6.986	11	10 36 7.29	1.9003	14 26 37.5	10.620
12	9 3 5.87	2.0698	21 28 49.4	7.079	12	10 38 1.23	1.8977	14 15 58.6	10.678
13	9 5 9.93	2.0657	21 21 41.9	7.172	13	10 39 55.01	1.8950	14 5 16.2	10.736
14	9 7 13.75	2.0616	21 14 28.8	7.264	14	10 41 48.63	1.8923	13 54 30.3	10.794
15	9 9 17.32	2.0574	21 7 10.2	7.355	15	10 43 42.09	1.8897	13 43 40.9	10.851
16	9 11 20.64	2.0533	20 59 46.2	7.444	16	10 45 35.40	1.8873	13 32 48.2	10.906
17	9 13 23.71	2.0492	20 52 16.9	7.533	17	10 47 28.57	1.8850	13 21 52.2	10.961
18	9 15 26.54	2.0451	20 44 42.2	7.622	18	10 49 21.60	1.8827	13 10 52.9	11.015
19	9 17 29.12	2.0409	20 37 2.2	7.710	19	10 51 14.49	1.8803	12 59 50.4	11.069
20	9 19 31.45	2.0368	20 29 17.0	7.797	20	10 53 7.24	1.8780	12 48 44.6	11.123
21	9 21 33.54	2.0328	20 21 26.5	7.884	21	10 54 59.85	1.8758	12 37 35.6	11.176
22	9 23 35.39	2.0287	20 13 30.9	7.969	22	10 56 52.33	1.8737	12 26 23.5	11.228
23	9 25 36.99	2.0247	N.20 5 30.2	8.053	23	10 58 44.69	1.8716	N.12 15 8.3	11.280
	TUESDAY 2.					THURSDAY 4.			
0	9 27 38.35	2.0207	N.19 57 24.5	8.137	0	11 0 36.92	1.8695	N.12 3 49.9	11.332
1	9 29 39.47	2.0167	19 49 13.8	8.220	1	11 2 29.03	1.8676	11 52 28.5	11.381
2	9 31 40.35	2.0127	19 40 58.1	8.303	2	11 4 21.03	1.8657	11 41 4.2	11.430
3	9 33 40.99	2.0087	19 32 37.4	8.386	3	11 6 12.91	1.8638	11 29 36.9	11.479
4	9 35 41.40	2.0048	19 24 11.8	8.467	4	11 8 4.68	1.8619	11 18 6.7	11.527
5	9 37 41.57	2.0009	19 15 41.4	8.546	5	11 9 56.34	1.8602	11 6 33.6	11.575
6	9 39 41.51	1.9970	19 7 6.3	8.625	6	11 11 47.90	1.8585	10 54 57.7	11.622
7	9 41 41.21	1.9932	18 58 26.4	8.704	7	11 13 39.36	1.8568	10 43 19.0	11.669
8	9 43 40.69	1.9894	18 49 41.8	8.782	8	11 15 30.72	1.8552	10 31 37.5	11.715
9	9 45 39.94	1.9856	18 40 52.6	8.859	9	11 17 21.99	1.8537	10 19 53.2	11.761
10	9 47 38.96	1.9818	18 31 58.8	8.936	10	11 19 13.17	1.8523	10 8 6.2	11.805
11	9 49 37.76	1.9781	18 23 0.3	9.012	11	11 21 4.27	1.8509	9 56 16.6	11.848
12	9 51 36.34	1.9744	18 13 57.3	9.087	12	11 22 55.28	1.8496	9 44 24.4	11.892
13	9 53 34.69	1.9708	18 4 49.9	9.161	13	11 24 46.22	1.8483	9 32 29.6	11.935
14	9 55 32.83	1.9672	17 55 38.0	9.235	14	11 26 37.08	1.8471	9 20 32.2	11.977
15	9 57 30.75	1.9636	17 46 21.7	9.308	15	11 28 27.87	1.8459	9 8 32.3	12.018
16	9 59 28.46	1.9600	17 37 1.0	9.380	16	11 30 18.59	1.8448	8 56 30.0	12.059
17	10 1 25.95	1.9564	17 27 36.1	9.451	17	11 32 9.25	1.8438	8 44 25.2	12.100
18	10 3 23.23	1.9529	17 18 6.9	9.522	18	11 33 59.85	1.8428	8 32 18.0	12.139
19	10 5 20.30	1.9495	17 8 33.5	9.592	19	11 35 50.39	1.8419	8 20 8.5	12.178
20	10 7 17.17	1.9462	16 58 55.9	9.662	20	11 37 40.88	1.8412	8 7 56.6	12.217
21	10 9 13.84	1.9428	16 49 14.1	9.731	21	11 39 31.33	1.8405	7 55 42.4	12.256
22	10 11 10.31	1.9395	16 39 28.2	9.799	22	11 41 21.74	1.8397	7 43 25.9	12.293
23	10 13 6.58	1.9362	16 29 38.3	9.866	23	11 43 12.10	1.8390	7 31 7.2	12.329
24	10 15 2.65	1.9329	N.16 19 44.3	9.933	24	11 45 2.42	1.8384	N. 7 18 46.4	12.365

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 5.					**SUNDAY 7.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	11 45 2.42	1.8384	N. 7 18 46.4	12.365	0	13 13 55.63	1.8924	S. 3 3 58.7	13.316
1	11 46 52.71	1.8380	7 6 23.4	12.401	1	13 15 49.26	1.8953	3 17 17.7	13.317
2	11 48 42.98	1.8376	6 53 58.3	12.435	2	13 17 43.07	1.8983	3 30 36.8	13.318
3	11 50 33.22	1.8372	6 41 31.2	12.469	3	13 19 37.06	1.9014	3 43 55.9	13.318
4	11 52 23.44	1.8368	6 29 2.1	12.503	4	13 21 31.24	1.9045	3 57 15.0	13.317
5	11 54 13.64	1.8366	6 16 30.9	12.537	5	13 23 25.60	1.9076	4 10 34.0	13.316
6	11 56 3.83	1.8364	6 3 57.7	12.569	6	13 25 20.15	1.9108	4 23 52.9	13.313
7	11 57 54.01	1.8363	5 51 22.6	12.600	7	13 27 14.90	1.9142	4 37 11.6	13.309
8	11 59 44.19	1.8362	5 38 45.7	12.631	8	13 29 9.86	1.9177	4 50 30.0	13.304
9	12 1 34.36	1.8362	5 26 6.9	12.662	9	13 31 5.03	1.9212	5 3 48.1	13.299
10	12 3 24.54	1.8364	5 13 26.3	12.691	10	13 33 0.41	1.9248	5 17 5.9	13.293
11	12 5 14.73	1.8366	5 0 44.0	12.720	11	13 34 56.01	1.9284	5 30 23.3	13.286
12	12 7 4.93	1.8368	4 47 59.9	12.749	12	13 36 51.82	1.9321	5 43 40.2	13.277
13	12 8 55.14	1.8371	4 35 14.1	12.777	13	13 38 47.86	1.9359	5 56 56.5	13.268
14	12 10 45.38	1.8375	4 22 26.7	12.804	14	13 40 44.13	1.9398	6 10 12.3	13.258
15	12 12 35.64	1.8379	4 9 37.6	12.831	15	13 42 40.63	1.9437	6 23 27.5	13.247
16	12 14 25.93	1.8384	3 56 46.9	12.856	16	13 44 37.37	1.9477	6 36 42.0	13.235
17	12 16 16.25	1.8390	3 43 54.8	12.881	17	13 46 34.36	1.9518	6 49 55.7	13.222
18	12 18 6.61	1.8397	3 31 1.2	12.906	18	13 48 31.59	1.9559	7 3 8.6	13.207
19	12 19 57.01	1.8404	3 18 6.1	12.930	19	13 50 29.07	1.9602	7 16 20.6	13.192
20	12 21 47.46	1.8412	3 5 9.6	12.953	20	13 52 26.81	1.9646	7 29 31.7	13.176
21	12 23 37.96	1.8421	2 52 11.7	12.976	21	13 54 24.82	1.9690	7 42 41.7	13.158
22	12 25 28.51	1.8429	2 39 12.4	12.998	22	13 56 23.09	1.9734	7 55 50.6	13.139
23	12 27 19.11	1.8438	N. 2 26 11.9	13.019	23	13 58 21.63	1.9779	S. 8 8 58.4	13.121
	SATURDAY 6.					**MONDAY 8.**			
0	12 29 9.77	1.8449	N. 2 13 10.1	13.040	0	14 0 20.44	1.9825	S. 8 22 5.1	13.101
1	12 31 0.50	1.8461	2 0 7.1	13.060	1	14 2 19.53	1.9872	8 35 10.5	13.078
2	12 32 51.30	1.8473	1 47 2.9	13.079	2	14 4 18.90	1.9919	8 48 14.5	13.055
3	12 34 42.18	1.8486	1 33 57.6	13.098	3	14 6 18.56	1.9968	9 1 17.1	13.031
4	12 36 33.14	1.8500	1 20 51.2	13.116	4	14 8 18.51	2.0017	9 14 18.2	13.007
5	12 38 24.18	1.8514	1 7 43.7	13.133	5	14 10 18.76	2.0066	9 27 17.9	12.982
6	12 40 15.31	1.8529	0 54 35.2	13.149	6	14 12 19.30	2.0116	9 40 16.0	12.954
7	12 42 6.53	1.8545	0 41 25.8	13.164	7	14 14 20.15	2.0167	9 53 12.4	12.925
8	12 43 57.85	1.8561	0 28 15.5	13.180	8	14 16 21.31	2.0219	10 6 7.0	12.895
9	12 45 49.27	1.8578	0 15 4.2	13.195	9	14 18 22.78	2.0271	10 18 59.8	12.864
10	12 47 40.79	1.8596	N. 0 1 52.1	13.208	10	14 20 24.56	2.0324	10 31 50.7	12.832
11	12 49 32.42	1.8615	S. 0 11 20.7	13.220	11	14 22 26.67	2.0378	10 44 39.6	12.798
12	12 51 24.17	1.8635	0 24 34.3	13.232	12	14 24 29.10	2.0432	10 57 26.5	12.764
13	12 53 16.04	1.8655	0 37 48.6	13.244	13	14 26 31.86	2.0487	11 10 11.3	12.728
14	12 55 8.03	1.8675	0 51 3.6	13.255	14	14 28 34.95	2.0543	11 22 53.9	12.691
15	12 57 0.14	1.8696	1 4 19.2	13.264	15	14 30 38.38	2.0600	11 35 34.3	12.653
16	12 58 52.38	1.8718	1 17 35.3	13.273	16	14 32 42.15	2.0657	11 48 12.3	12.613
17	13 0 44.76	1.8742	1 30 51.9	13.281	17	14 34 46.26	2.0714	12 0 47.9	12.572
18	13 2 37.29	1.8767	1 44 9.0	13.288	18	14 36 50.72	2.0772	12 13 21.0	12.530
19	13 4 29.96	1.8791	1 57 26.5	13.295	19	14 38 55.53	2.0832	12 25 51.5	12.487
20	13 6 22.78	1.8816	2 10 44.4	13.301	20	14 41 0.70	2.0892	12 38 19.4	12.442
21	13 8 15.75	1.8842	2 24 2.6	13.306	21	14 43 6.23	2.0952	12 50 44.6	12.396
22	13 10 8.88	1.8868	2 37 21.1	13.310	22	14 45 12.12	2.1012	13 3 6.9	12.348
23	13 12 2.17	1.8896	2 50 39.9	13.313	23	14 47 18.38	2.1073	13 15 26.3	12.299
24	13 13 55.63	1.8924	S. 3 3 58.7	13.316	24	14 49 25.00	2.1134	S. 13 27 42.8	12.249

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	14 49 25.00	2.1134	S. 13 27 42.8	12.249
1	14 51 31.99	2.1197	13 39 56.2	12.197
2	14 53 39.37	2.1261	13 52 6.5	12.144
3	14 55 47.13	2.1325	14 4 13.5	12.089
4	14 57 55.27	2.1389	14 16 17.2	12.033
5	15 0 3.80	2.1454	14 28 17.5	11.976
6	15 2 12.72	2.1519	14 40 14.3	11.917
7	15 4 22.03	2.1585	14 52 7.5	11.857
8	15 6 31.74	2.1651	15 3 57.1	11.795
9	15 8 41.84	2.1717	15 15 42.9	11.732
10	15 10 52.34	2.1784	15 27 24.9	11.667
11	15 13 3.25	2.1852	15 39 2.9	11.600
12	15 15 14.57	2.1921	15 50 36.9	11.532
13	15 17 26.30	2.1989	16 2 6.8	11.463
14	15 19 38.44	2.2058	16 13 32.5	11.392
15	15 21 50.99	2.2127	16 24 53.8	11.319
16	15 24 3.96	2.2197	16 36 10.7	11.245
17	15 26 17.35	2.2267	16 47 23.2	11.170
18	15 28 31.16	2.2337	16 58 31.1	11.092
19	15 30 45.39	2.2407	17 9 34.3	11.013
20	15 33 0.05	2.2478	17 20 32.7	10.932
21	15 35 15.13	2.2549	17 31 26.2	10.850
22	15 37 30.64	2.2621	17 42 14.7	10.767
23	15 39 46.58	2.2692	S. 17 52 58.2	10.682

WEDNESDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	15 42 2.95	2.2764	S. 18 3 36.5	10.594
1	15 44 19.75	2.2837	18 14 9.5	10.506
2	15 46 36.99	2.2909	18 24 37.2	10.416
3	15 48 54.66	2.2981	18 34 59.4	10.324
4	15 51 12.76	2.3053	18 45 16.1	10.231
5	15 53 31.30	2.3126	18 55 27.1	10.135
6	15 55 50.28	2.3199	19 5 32.3	10.038
7	15 58 9.69	2.3272	19 15 31.7	9.940
8	16 0 29.54	2.3344	19 25 25.1	9.839
9	16 2 49.82	2.3317	19 35 12.4	9.737
10	16 5 10.54	2.3490	19 44 53.6	9.634
11	16 7 31.70	2.3563	19 54 28.5	9.529
12	16 9 53.30	2.3636	20 3 57.1	9.422
13	16 12 15.33	2.3708	20 13 19.2	9.313
14	16 14 37.80	2.3781	20 22 34.7	9.203
15	16 17 0.70	2.3853	20 31 43.5	9.091
16	16 19 24.03	2.3924	20 40 45.6	8.977
17	16 21 47.79	2.3997	20 49 40.8	8.862
18	16 24 11.99	2.4069	20 58 29.0	8.744
19	16 26 36.62	2.4140	21 7 10.1	8.626
20	16 29 1.67	2.4210	21 15 44.1	8.506
21	16 31 27.14	2.4281	21 24 10.8	8.383
22	16 33 53.04	2.4352	21 32 30.1	8.260
23	16 36 19.36	2.4422	21 40 42.0	8.135
24	16 38 46.11	2.4492	S. 21 48 46.3	8.008

THURSDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	16 38 46.11	2.4492	S. 21 48 46.3	8.008
1	16 41 13.27	2.4561	21 56 42.9	7.879
2	16 43 40.84	2.4629	22 4 31.8	7.749
3	16 46 8.82	2.4697	22 12 12.8	7.617
4	16 48 37.20	2.4764	22 19 45.9	7.484
5	16 51 5.99	2.4831	22 27 10.9	7.349
6	16 53 35.18	2.4898	22 34 27.8	7.213
7	16 56 4.77	2.4964	22 41 36.5	7.075
8	16 58 34.75	2.5028	22 48 36.8	6.934
9	17 1 5.11	2.5092	22 55 28.6	6.793
10	17 3 35.85	2.5155	23 2 11.9	6.651
11	17 6 6.97	2.5218	23 8 46.7	6.507
12	17 8 38.47	2.5281	23 15 12.8	6.362
13	17 11 10.34	2.5342	23 21 30.1	6.214
14	17 13 42.57	2.5402	23 27 38.5	6.065
15	17 16 15.16	2.5461	23 33 37.9	5.915
16	17 18 48.10	2.5519	23 39 28.3	5.764
17	17 21 21.39	2.5576	23 45 9.6	5.611
18	17 23 55.01	2.5632	23 50 41.6	5.456
19	17 26 28.97	2.5687	23 56 4.3	5.301
20	17 29 3.26	2.5742	24 1 17.7	5.145
21	17 31 37.87	2.5795	24 6 21.7	4.987
22	17 34 12.80	2.5847	24 11 16.1	4.827
23	17 36 48.03	2.5897	S. 24 16 0.9	4.666

FRIDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	17 39 23.56	2.5947	S. 24 20 36.0	4.504
1	17 41 59.39	2.5995	24 25 1.3	4.341
2	17 44 35.50	2.6042	24 29 16.9	4.178
3	17 47 11.89	2.6087	24 33 22.6	4.013
4	17 49 48.55	2.6132	24 37 18.4	3.847
5	17 52 25.47	2.6175	24 41 4.2	3.679
6	17 55 2.65	2.6217	24 44 39.9	3.511
7	17 57 40.08	2.6257	24 48 5.5	3.342
8	18 0 17.74	2.6296	24 51 20.9	3.171
9	18 2 55.63	2.6333	24 54 26.0	2.999
10	18 5 33.74	2.6369	24 57 20.8	2.827
11	18 8 12.06	2.6404	25 0 5.2	2.654
12	18 10 50.59	2.6437	25 2 39.3	2.481
13	18 13 29.31	2.6469	25 5 2.9	2.306
14	18 16 8.22	2.6499	25 7 16.0	2.131
15	18 18 47.30	2.6527	25 9 18.6	1.955
16	18 21 26.54	2.6553	25 11 10.6	1.779
17	18 24 5.94	2.6579	25 12 52.0	1.602
18	18 26 45.49	2.6602	25 14 22.8	1.424
19	18 29 25.17	2.6624	25 15 42.9	1.245
20	18 32 4.98	2.6646	25 16 52.2	1.066
21	18 34 44.92	2.6665	25 17 50.8	0.887
22	18 37 24.96	2.6681	25 18 38.6	0.707
23	18 40 5.09	2.6696	25 19 15.6	0.527
24	18 42 45.31	2.6710	S. 25 19 41.9	0.347

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	18 42 45.31	2.6710	S. 25 19 41.9	0.347
1	18 45 25.61	2.6722	25 19 57.3	– 0.167
2	18 48 5.98	2.6732	25 20 1.9	+ 0.014
3	18 50 46.40	2.6741	25 19 55.6	0.196
4	18 53 26.87	2.6748	25 19 38.4	0.377
5	18 56 7.38	2.6753	25 19 10.4	0.558
6	18 58 47.91	2.6757	25 18 31.5	0.739
7	19 1 28.46	2.6759	25 17 41.7	0.921
8	19 4 9.02	2.6759	25 16 41.0	1.102
9	19 6 49.57	2.6757	25 15 29.5	1.283
10	19 9 30.11	2.6755	25 14 7.1	1.464
11	19 12 10.63	2.6750	25 12 33.8	1.645
12	19 14 51.11	2.6743	25 10 49.7	1.826
13	19 17 31.55	2.6736	25 8 54.7	2.007
14	19 20 11.94	2.6726	25 6 48.9	2.187
15	19 22 52.26	2.6714	25 4 32.3	2.367
16	19 25 32.51	2.6702	25 2 4.9	2.547
17	19 28 12.68	2.6687	24 59 26.7	2.726
18	19 30 52.75	2.6670	24 56 37.8	2.904
19	19 33 32.72	2.6653	24 53 38.2	3.083
20	19 36 12.59	2.6634	24 50 27.9	3.261
21	19 38 52.33	2.6613	24 47 6.9	3.438
22	19 41 31.94	2.6591	24 43 35.3	3.614
23	19 44 11.42	2.6567	S. 24 39 53.2	3.790

SUNDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	19 46 50.75	2.6542	S. 24 36 0.5	3.966
1	19 49 29.92	2.6515	24 31 57.3	4.140
2	19 52 8.93	2.6487	24 27 43.7	4.314
3	19 54 47.76	2.6457	24 23 19.6	4.487
4	19 57 26.41	2.6426	24 18 45.2	4.659
5	20 0 4.87	2.6393	24 14 0.5	4.830
6	20 2 43.13	2.6360	24 9 5.6	5.000
7	20 5 21.19	2.6325	24 4 0.5	5.170
8	20 7 59.03	2.6288	23 58 45.2	5.338
9	20 10 36.65	2.6251	23 53 19.9	5.505
10	20 13 14.04	2.6212	23 47 44.6	5.672
11	20 15 51.19	2.6172	23 41 59.3	5.838
12	20 18 28.10	2.6131	23 36 4.1	6.002
13	20 21 4.76	2.6088	23 29 59.1	6.164
14	20 23 41.16	2.6045	23 23 44.4	6.326
15	20 26 17.30	2.6001	23 17 20.0	6.487
16	20 28 53.17	2.5956	23 10 46.0	6.647
17	20 31 28.77	2.5909	23 4 2.4	6.805
18	20 34 4.08	2.5861	22 57 9.4	6.961
19	20 36 39.10	2.5813	22 50 7.1	7.117
20	20 39 13.83	2.5764	22 42 55.4	7.272
21	20 41 48.27	2.5714	22 35 34.5	7.424
22	20 44 22.40	2.5663	22 28 4.5	7.576
23	20 46 56.22	2.5611	22 20 25.4	7.726
24	20 49 29.73	2.5559	S. 22 12 37.4	7.874

MONDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	20 49 29.73	2.5559	S. 22 12 37.4	7.874
1	20 52 2.93	2.5506	22 4 40.5	8.022
2	20 54 35.80	2.5451	21 56 34.7	8.168
3	20 57 8.34	2.5396	21 48 20.3	8.312
4	20 59 40.55	2.5341	21 39 57.3	8.455
5	21 2 12.43	2.5285	21 31 25.7	8.597
6	21 4 43.97	2.5228	21 22 45.7	8.737
7	21 7 15.17	2.5171	21 13 57.3	8.875
8	21 9 46.03	2.5114	21 5 0.7	9.012
9	21 12 16.54	2.5056	20 55 55.9	9.148
10	21 14 46.70	2.4997	20 46 43.0	9.282
11	21 17 16.51	2.4938	20 37 22.1	9.413
12	21 19 45.96	2.4878	20 27 53.4	9.543
13	21 22 15.05	2.4819	20 18 16.9	9.672
14	21 24 43.79	2.4760	20 8 32.7	9.800
15	21 27 12.17	2.4700	19 58 40.9	9.926
16	21 29 40.19	2.4639	19 48 41.6	10.050
17	21 32 7.84	2.4578	19 38 34.9	10.172
18	21 34 35.13	2.4517	19 28 21.0	10.292
19	21 37 2.05	2.4456	19 17 59.9	10.412
20	21 39 28.60	2.4395	19 7 31.6	10.530
21	21 41 54.79	2.4334	18 56 56.3	10.646
22	21 44 20.61	2.4273	18 46 14.1	10.759
23	21 46 46.06	2.4212	S. 18 35 25.2	10.871

TUESDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	21 49 11.15	2.4151	S. 18 24 29.6	10.983
1	21 51 35.87	2.4089	18 13 27.3	11.092
2	21 54 0.21	2.4027	18 2 18.6	11.198
3	21 56 24.19	2.3966	17 51 3.5	11.304
4	21 58 47.80	2.3905	17 39 42.1	11.408
5	22 1 11.05	2.3844	17 28 14.5	11.510
6	22 3 33.93	2.3783	17 16 40.9	11.610
7	22 5 56.45	2.3722	17 5 1.3	11.709
8	22 8 18.60	2.3661	16 53 15.8	11.807
9	22 10 40.38	2.3600	16 41 24.4	11.903
10	22 13 1.80	2.3541	16 29 27.4	11.997
11	22 15 22.87	2.3482	16 17 24.8	12.088
12	22 17 43.58	2.3422	16 5 16.8	12.178
13	22 20 3.93	2.3362	15 53 3.4	12.267
14	22 22 23.93	2.3303	15 40 44.7	12.354
15	22 24 43.57	2.3244	15 28 20.9	12.439
16	22 27 2.86	2.3186	15 15 52.0	12.523
17	22 29 21.81	2.3129	15 3 18.1	12.606
18	22 31 40.41	2.3072	14 50 39.2	12.687
19	22 33 58.67	2.3014	14 37 55.6	12.766
20	22 36 16.58	2.2957	14 25 7.3	12.843
21	22 38 34.15	2.2901	14 12 14.5	12.918
22	22 40 51.39	2.2846	13 59 17.2	12.992
23	22 43 8.30	2.2790	13 46 15.5	13.064
24	22 45 24.87	2.2735	S. 13 33 9.5	13.135

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 17.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	22 45 24.87	2.2735	S. 13 33 9.5	13.135
1	22 47 41.12	2.2681	13 19 59.3	13.204
2	22 49 57.05	2.2627	13 6 45.0	13.271
3	22 52 12.65	2.2573	12 53 26.8	13.336
4	22 54 27.93	2.2521	12 40 4.7	13.401
5	22 56 42.90	2.2470	12 26 38.7	13.464
6	22 58 57.57	2.2419	12 13 9.0	13.525
7	23 1 11.93	2.2368	11 59 35.7	13.584
8	23 3 25.98	2.2317	11 45 58.9	13.642
9	23 5 39.73	2.2267	11 32 18.7	13.698
10	23 7 53.18	2.2218	11 18 35.1	13.753
11	23 10 6.35	2.2171	11 4 48.3	13.807
12	23 12 19.23	2.2123	10 50 58.3	13.858
13	23 14 31.83	2.2076	10 37 5.3	13.908
14	23 16 44.14	2.2029	10 23 9.3	13.957
15	23 18 56.17	2.1982	10 9 10.5	14.004
16	23 21 7.93	2.1937	9 55 8.9	14.050
17	23 23 19.42	2.1893	9 41 4.5	14.094
18	23 25 30.65	2.1850	9 26 57.6	14.136
19	23 27 41.62	2.1807	9 12 48.2	14.177
20	23 29 52.33	2.1764	8 58 36.3	14.217
21	23 32 2.79	2.1723	8 44 22.1	14.256
22	23 34 13.01	2.1682	8 30 5.6	14.293
23	23 36 22.98	2.1642	S. 8 15 46.9	14.328

THURSDAY 18.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	23 38 32.71	2.1602	S. 8 1 26.2	14.362
1	23 40 42.21	2.1564	7 47 3.5	14.394
2	23 42 51.48	2.1526	7 32 38.9	14.426
3	23 45 0.52	2.1488	7 18 12.4	14.456
4	23 47 9.34	2.1452	7 3 44.2	14.483
5	23 49 17.95	2.1417	6 49 14.4	14.510
6	23 51 26.35	2.1382	6 34 43.0	14.536
7	23 53 34.54	2.1348	6 20 10.1	14.560
8	23 55 42.53	2.1314	6 5 35.8	14.582
9	23 57 50.31	2.1281	5 51 0.2	14.603
10	23 59 57.90	2.1250	5 36 23.4	14.623
11	0 2 5.31	2.1220	5 21 45.4	14.642
12	0 4 12.54	2.1190	5 7 6.3	14.660
13	0 6 19.59	2.1160	4 52 26.2	14.676
14	0 8 26.46	2.1131	4 37 45.2	14.690
15	0 10 33.16	2.1102	4 23 3.4	14.703
16	0 12 39.69	2.1076	4 8 20.8	14.716
17	0 14 46.07	2.1050	3 53 37.5	14.727
18	0 16 52.29	2.1024	3 38 53.6	14.737
19	0 18 58.36	2.0999	3 24 9.1	14.745
20	0 21 4.28	2.0975	3 9 24.2	14.751
21	0 23 10.06	2.0952	2 54 39.0	14.756
22	0 25 15.71	2.0930	2 39 53.5	14.761
23	0 27 21.22	2.0907	2 25 7.7	14.764
24	0 29 26.60	2.0887	S. 2 10 21.8	14.765

FRIDAY 19.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	0 29 26.60	2.0887	S. 2 10 21.8	14.765
1	0 31 31.86	2.0867	1 55 35.9	14.766
2	0 33 37.01	2.0848	1 40 49.9	14.766
3	0 35 42.04	2.0829	1 26 4.0	14.764
4	0 37 46.96	2.0812	1 11 18.2	14.761
5	0 39 51.78	2.0795	0 56 32.7	14.756
6	0 41 56.50	2.0779	0 41 47.5	14.750
7	0 44 1.13	2.0764	0 27 2.7	14.743
8	0 46 5.67	2.0749	S. 0 12 18.3	14.736
9	0 48 10.12	2.0735	N. 0 2 25.6	14.727
10	0 50 14.49	2.0722	0 17 8.9	14.716
11	0 52 18.79	2.0710	0 31 51.5	14.704
12	0 54 23.01	2.0698	0 46 33.4	14.692
13	0 56 27.16	2.0687	1 1 14.5	14.678
14	0 58 31.26	2.0678	1 15 54.7	14.662
15	1 0 35.30	2.0669	1 30 33.9	14.645
16	1 2 39.29	2.0661	1 45 12.1	14.628
17	1 4 43.23	2.0653	1 59 49.3	14.610
18	1 6 47.12	2.0645	2 14 25.3	14.590
19	1 8 50.97	2.0639	2 29 0.1	14.569
20	1 10 54.79	2.0634	2 43 33.6	14.547
21	1 12 58.58	2.0629	2 58 5.7	14.523
22	1 15 2.34	2.0625	3 12 36.4	14.499
23	1 17 6.08	2.0622	N. 3 27 5.6	14.473

SATURDAY 20.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	1 19 9.80	2.0619	N. 3 41 33.2	14.447
1	1 21 13.51	2.0617	3 55 59.2	14.419
2	1 23 17.21	2.0617	4 10 23.5	14.390
3	1 25 20.91	2.0617	4 24 46.0	14.359
4	1 27 24.61	2.0617	4 39 6.6	14.328
5	1 29 28.31	2.0617	4 53 25.4	14.297
6	1 31 32.01	2.0618	5 7 42.2	14.263
7	1 33 35.73	2.0621	5 21 56.9	14.228
8	1 35 39.47	2.0624	5 36 9.5	14.193
9	1 37 43.22	2.0627	5 50 20.0	14.156
10	1 39 47.00	2.0632	6 4 28.2	14.118
11	1 41 50.81	2.0637	6 18 34.1	14.079
12	1 43 54.65	2.0643	6 32 37.7	14.039
13	1 45 58.53	2.0650	6 46 38.8	13.997
14	1 48 2.45	2.0657	7 0 37.4	13.955
15	1 50 6.41	2.0664	7 14 33.4	13.911
16	1 52 10.42	2.0673	7 28 26.7	13.867
17	1 54 14.48	2.0682	7 42 17.4	13.822
18	1 56 18.60	2.0691	7 56 5.3	13.775
19	1 58 22.77	2.0701	8 9 50.4	13.727
20	2 0 27.01	2.0712	8 23 32.6	13.678
21	2 2 31.32	2.0724	8 37 11.8	13.628
22	2 4 35.70	2.0736	8 50 48.0	13.577
23	2 6 40.15	2.0748	9 4 21.1	13.525
24	2 8 44.68	2.0761	N. 9 17 51.0	13.472

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 21.					TUESDAY 23.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	2 8 44.68	2.0761	N. 9 17 51.0	13.472	0	3 50 46.22	2.1868	N.18 43 36.2	9.716
1	2 10 49.29	2.0775	9 31 17.7	13.418	1	3 52 57.51	2.1896	18 53 16.1	9.614
2	2 12 53.98	2.0789	9 44 41.2	13.363	2	3 55 8.97	2.1924	19 2 49.9	9.512
3	2 14 58.76	2.0804	9 58 1.3	13.307	3	3 57 20.60	2.1952	19 12 17.5	9.408
4	2 17 3.63	2.0820	10 11 18.0	13.249	4	3 59 32.39	2.1979	19 21 38.8	9.303
5	2 19 8.60	2.0836	10 24 31.2	13.191	5	4 1 44.35	2.2007	19 30 53.9	9.198
6	2 21 13.66	2.0852	10 37 40.9	13.132	6	4 3 56.48	2.2035	19 40 2.6	9.092
7	2 23 18.82	2.0868	10 50 47.0	13.071	7	4 6 8.77	2.2062	19 49 4.9	8.984
8	2 25 24.08	2.0886	11 3 49.4	13.009	8	4 8 21.23	2.2090	19 58 0.7	8.876
9	2 27 29.45	2.0904	11 16 48.1	12.947	9	4 10 33.85	2.2117	20 6 50.1	8.768
10	2 29 34.93	2.0923	11 29 43.0	12.883	10	4 12 46.63	2.2144	20 15 32.9	8.658
11	2 31 40.52	2.0942	11 42 34.0	12.818	11	4 14 59.57	2.2171	20 24 9.1	8.547
12	2 33 46.23	2.0961	11 55 21.1	12.753	12	4 17 12.68	2.2198	20 32 38.6	8.436
13	2 35 52.05	2.0980	12 8 4.3	12.686	13	4 19 25.95	2.2224	20 41 1.4	8.324
14	2 37 57.99	2.1001	12 20 43.4	12.618	14	4 21 39.37	2.2250	20 49 17.5	8.212
15	2 40 4.06	2.1022	12 33 18.4	12.549	15	4 23 52.95	2.2276	20 57 26.9	8.099
16	2 42 10.25	2.1043	12 45 49.3	12.479	16	4 26 6.68	2.2302	21 5 29.4	7.984
17	2 44 16.57	2.1064	12 58 15.9	12.407	17	4 28 20.57	2.2327	21 13 25.0	7.870
18	2 46 23.02	2.1086	13 10 38.2	12.335	18	4 30 34.61	2.2352	21 21 13.8	7.755
19	2 48 29.60	2.1108	13 22 56.1	12.262	19	4 32 48.80	2.2377	21 28 55.6	7.638
20	2 50 36.32	2.1131	13 35 9.7	12.189	20	4 35 3.13	2.2401	21 36 30.3	7.520
21	2 52 43.17	2.1153	13 47 18.8	12.114	21	4 37 17.61	2.2425	21 43 58.0	7.402
22	2 54 50.16	2.1177	13 59 23.4	12.038	22	4 39 32.23	2.2449	21 51 18.6	7.283
23	2 56 57.30	2.1202	N.14 11 23.4	11.961	23	4 41 47.00	2.2473	N.21 58 32.0	7.164
	MONDAY 22.					WEDNESDAY 24.			
0	2 59 4.58	2.1226	N.14 23 18.7	11.882	0	4 44 1.91	2.2497	N.22 5 38.3	7.045
1	3 1 12.01	2.1250	14 35 9.3	11.803	1	4 46 16.96	2.2519	22 12 37.4	6.924
2	3 3 19.58	2.1274	14 46 55.1	11.723	2	4 48 32.14	2.2541	22 19 29.2	6.803
3	3 5 27.30	2.1299	14 58 36.1	11.643	3	4 50 47.45	2.2562	22 26 13.7	6.681
4	3 7 35.17	2.1324	15 10 12.2	11.561	4	4 53 2.89	2.2583	22 32 50.9	6.559
5	3 9 43.19	2.1350	15 21 43.4	11.478	5	4 55 18.45	2.2603	22 39 20.8	6.437
6	3 11 51.37	2.1376	15 33 9.5	11.393	6	4 57 34.13	2.2624	22 45 43.3	6.313
7	3 13 59.70	2.1402	15 44 30.5	11.308	7	4 59 49.94	2.2645	22 51 58.3	6.188
8	3 16 8.19	2.1428	15 55 46.4	11.223	8	5 2 5.87	2.2664	22 58 5.9	6.064
9	3 18 16.84	2.1455	16 6 57.2	11.136	9	5 4 21.91	2.2683	23 4 6.0	5.939
10	3 20 25.65	2.1482	16 18 2.7	11.047	10	5 6 38.06	2.2701	23 9 58.6	5.813
11	3 22 34.62	2.1508	16 29 2.9	10.958	11	5 8 54.32	2.2718	23 15 43.6	5.687
12	3 24 43.75	2.1535	16 39 57.7	10.868	12	5 11 10.68	2.2735	23 21 21.0	5.560
13	3 26 53.04	2.1562	16 50 47.1	10.777	13	5 13 27.14	2.2752	23 26 50.8	5.432
14	3 29 2.50	2.1590	17 1 31.0	10.686	14	5 15 43.70	2.2768	23 32 12.9	5.305
15	3 31 12.12	2.1617	17 12 9.4	10.593	15	5 18 0.36	2.2784	23 37 27.4	5.177
16	3 33 21.91	2.1645	17 22 42.2	10.499	16	5 20 17.11	2.2798	23 42 34.2	5.048
17	3 35 31.86	2.1673	17 33 9.3	10.404	17	5 22 33.94	2.2812	23 47 33.2	4.919
18	3 37 41.98	2.1701	17 43 30.7	10.309	18	5 24 50.85	2.2825	23 52 24.5	4.790
19	3 39 52.27	2.1729	17 53 46.4	10.212	19	5 27 7.84	2.2838	23 57 8.0	4.660
20	3 42 2.73	2.1757	18 3 56.2	10.114	20	5 29 24.91	2.2851	24 1 43.7	4.531
21	3 44 13.35	2.1784	18 14 0.1	10.016	21	5 31 42.05	2.2862	24 6 11.7	4.401
22	3 46 24.14	2.1812	18 23 58.1	9.917	22	5 33 59.26	2.2872	24 10 31.8	4.269
23	3 48 35.10	2.1840	18 33 50.2	9.817	23	5 36 16.52	2.2882	24 14 44.0	4.138
24	3 50 46.22	2.1868	N.18 43 36.2	9.716	24	5 38 33.84	2.2891	N.24 18 48.4	4.007

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 25.					SATURDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	5 38 33.84	2.2891	N.24 18 48.4	4.007	0	7 28 2.84	2.2425	N.24 58 26.0	2.301
1	5 40 51.21	2.2900	24 22 44.9	3.876	1	7 30 17.31	2.2397	24 56 4.2	2.425
2	5 43 8.64	2.2909	24 26 33.5	3.744	2	7 32 31.61	2.2368	24 53 35.0	2.548
3	5 45 26.12	2.2917	24 30 14.1	3.611	3	7 34 45.73	2.2338	24 50 58.4	2.671
4	5 47 43.64	2.2922	24 33 46.8	3.478	4	7 36 59.67	2.2308	24 48 14.4	2.794
5	5 50 1.19	2.2927	24 37 11.5	3.346	5	7 39 13.43	2.2278	24 45 23.1	2.917
6	5 52 18.77	2.2932	24 40 28.3	3.213	6	7 41 27.01	2.2237	24 42 24.4	3.039
7	5 54 36.38	2.2937	24 43 37.1	3.080	7	7 43 40.40	2.2215	24 39 18.4	3.160
8	5 56 54.01	2.2940	24 46 37.9	2.948	8	7 45 53.59	2.2182	24 36 5.2	3.280
9	5 59 11.66	2.2943	24 49 30.8	2.815	9	7 48 6.59	2.2150	24 32 44.8	3.400
10	6 1 29.33	2.2945	24 52 15.7	2.681	10	7 50 19.39	2.2117	24 29 17.2	3.519
11	6 3 47.00	2.2945	24 54 52.5	2.547	11	7 52 31.99	2.2083	24 25 42.5	3.637
12	6 6 4.67	2.2945	24 57 21.3	2.413	12	7 54 44.38	2.2048	24 22 0.7	3.755
13	6 8 22.34	2.2945	24 59 42.1	2.280	13	7 56 56.56	2.2013	24 18 11.9	3.873
14	6 10 40.01	2.2944	25 1 54.9	2.147	14	7 59 8.53	2.1978	24 14 16.0	3.990
15	6 12 57.67	2.2942	25 3 59.7	2.013	15	8 1 20.30	2.1943	24 10 13.1	4.106
16	6 15 15.32	2.2939	25 5 56.5	1.880	16	8 3 31.85	2.1906	24 6 3.3	4.220
17	6 17 32.94	2.2934	25 7 45.3	1.746	17	8 5 43.17	2.1868	24 1 46.7	4.334
18	6 19 50.53	2.2929	25 9 26.0	1.612	18	8 7 54.27	2.1831	23 57 23.2	4.448
19	6 22 8.09	2.2924	25 10 58.7	1.478	19	8 10 5.15	2.1794	23 52 52.9	4.562
20	6 24 25.62	2.2919	25 12 23.4	1.345	20	8 12 15.80	2.1756	23 48 15.8	4.674
21	6 26 43.12	2.2912	25 13 40.1	1.212	21	8 14 26.22	2.1717	23 43 32.0	4.786
22	6 29 0.57	2.2903	25 14 48.8	1.078	22	8 16 36.41	2.1679	23 38 41.5	4.897
23	6 31 17.96	2.2894	N.25 15 49.5	0.944	23	8 18 46.37	2.1640	N.23 33 44.4	5.007
	FRIDAY 26.					SUNDAY 28			
0	6 33 35.30	2.2885	N.25 16 42.1	0.811	0	8 20 56.09	2.1600	N.23 28 40.7	5.117
1	6 35 52.58	2.2875	25 17 26.8	0.678	1	8 23 5.57	2.1561	23 23 30.4	5.225
2	6 38 9.80	2.2864	25 18 3.5	0.546	2	8 25 14.82	2.1521	23 18 13.7	5.333
3	6 40 26.95	2.2852	25 18 32.3	0.413	3	8 27 23.83	2.1481	23 12 50.5	5.440
4	6 42 44.03	2.2839	25 18 53.1	0.281	4	8 29 32.59	2.1440	23 7 20.9	5.546
5	6 45 1.02	2.2825	25 19 6.0	0.148	5	8 31 41.11	2.1400	23 1 45.0	5.652
6	6 47 17.93	2.2811	25 19 10.9	+ 0.016	6	8 33 49.39	2.1359	22 56 2.7	5.757
7	6 49 34.76	2.2797	25 19 7.9	− 0.116	7	8 35 57.42	2.1317	22 50 14.2	5.860
8	6 51 51.49	2.2780	25 18 57.0	0.247	8	8 38 5.20	2.1276	22 44 19.5	5.963
9	6 54 8.12	2.2763	25 18 38.3	0.377	9	8 40 12.73	2.1234	22 38 18.6	6.066
10	6 56 24.65	2.2746	25 18 11.7	0.508	10	8 42 20.01	2.1193	22 32 11.6	6.168
11	6 58 41.07	2.2728	25 17 37.3	0.639	11	8 44 27.04	2.1151	22 25 58.5	6.269
12	7 0 57.39	2.2710	25 16 55.0	0.770	12	8 46 33.82	2.1108	22 19 39.3	6.369
13	7 3 13.59	2.2690	25 16 4.9	0.899	13	8 48 40.34	2.1066	22 13 14.2	6.468
14	7 5 29.67	2.2669	25 15 7.1	1.028	14	8 50 46.61	2.1024	22 6 43.2	6.567
15	7 7 45.62	2.2648	25 14 1.5	1.158	15	8 52 52.63	2.0981	22 0 6.2	6.665
16	7 10 1.44	2.2626	25 12 48.1	1.287	16	8 54 58.39	2.0938	21 53 23.4	6.761
17	7 12 17.13	2.2603	25 11 27.0	1.415	17	8 57 3.89	2.0896	21 46 34.9	6.856
18	7 14 32.68	2.2579	25 9 58.3	1.542	18	8 59 9.14	2.0853	21 39 40.7	6.951
19	7 16 48.08	2.2555	25 8 21.9	1.670	19	9 1 14.13	2.0811	21 32 40.8	7.046
20	7 19 3.34	2.2531	25 6 37.9	1.798	20	9 3 18.87	2.0768	21 25 35.2	7.140
21	7 21 18.45	2.2506	25 4 46.2	1.924	21	9 5 23.35	2.0725	21 18 24.0	7.232
22	7 23 33.41	2.2480	25 2 47.0	2.049	22	9 7 27.57	2.0682	21 11 7.3	7.324
23	7 25 48.21	2.2453	25 0 40.3	2.175	23	9 9 31.53	2.0639	21 3 45.1	7.415
24	7 28 2.84	2.2425	N.24 58 26.0	2.301	24	9 11 35.24	2.0597	N.20 56 17.5	7.505

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	9 11 35.24	2.0597	N.20 56 17.5	7.505
1	9 13 38.69	2.0554	20 48 44.5	7.594
2	9 15 41.89	2.0511	20 41 6.2	7.683
3	9 17 44.83	2.0468	20 33 22.5	7.772
4	9 19 47.51	2.0426	20 25 33.6	7.858
5	9 21 49.94	2.0383	20 17 39.5	7.944
6	9 23 52.11	2.0341	20 9 40.3	8.029
7	9 25 54.03	2.0299	20 1 36.0	8.113
8	9 27 55.70	2.0257	19 53 26.7	8.197
9	9 29 57.11	2.0214	19 45 12.3	8.281
10	9 31 58.27	2.0173	19 36 53.0	8.362
11	9 33 59.18	2.0132	19 28 28.9	8.443
12	9 35 59.85	2.0091	19 19 59.9	8.523
13	9 38 0.27	2.0049	19 11 26.1	8.603
14	9 40 0.44	2.0008	19 2 47.6	8.682
15	9 42 0.36	1.9967	18 54 4.3	8.760
16	9 44 0.04	1.9926	18 45 16.4	8.837
17	9 45 59.47	1.9885	18 36 23.9	8.913
18	9 47 58.66	1.9845	18 27 26.8	8.989
19	9 49 57.61	1.9805	18 18 25.2	9.063
20	9 51 56.32	1.9766	18 9 19.2	9.137
21	9 53 54.80	1.9727	18 0 8.7	9.211
22	9 55 53.04	1.9687	17 50 53.9	9.283
23	9 57 51.05	1.9648	N.17 41 34.8	9.354

TUESDAY 30.

0	9 59 48.82	1.9609	N.17 32 11.4	9.425
1	10 1 46.36	1.9571	17 22 43.8	9.495
2	10 3 43.68	1.9534	17 13 12.0	9.564
3	10 5 40.77	1.9497	17 3 36.1	9.632
4	10 7 37.64	1.9460	16 53 56.1	9.700
5	10 9 34.29	1.9423	16 44 12.1	9.767
6	10 11 30.71	1.9386	16 34 24.0	9.834
7	10 13 26.92	1.9350	16 24 32.0	9.899
8	10 15 22.91	1.9314	16 14 36.1	9.963
9	10 17 18.69	1.9279	16 4 36.4	10.027
10	10 19 14.26	1.9244	15 54 32.9	10.090
11	10 21 9.62	1.9210	15 44 25.6	10.152
12	10 23 4.78	1.9176	15 34 14.6	10.214
13	10 24 59.74	1.9142	15 23 59.9	10.275
14	10 26 54.49	1.9109	15 13 41.6	10.335
15	10 28 49.04	1.9076	15 3 19.7	10.395
16	10 30 43.40	1.9043	14 52 54.2	10.453
17	10 32 37.56	1.9011	14 42 25.3	10.511
18	10 34 31.53	1.8980	14 31 52.9	10.568
19	10 36 25.32	1.8949	14 21 17.1	10.625
20	10 38 18.92	1.8918	14 10 37.9	10.681
21	10 40 12.34	1.8888	13 59 55.4	10.736
22	10 42 5.58	1.8859	13 49 9.6	10.790
23	10 43 58.65	1.8830	13 38 20.6	10.844
24	10 45 51.54	1.8801	N.13 27 28.3	10.897

WEDNESDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	10 45 51.54	1.8801	N.13 27 28.3	10.897
1	10 47 44.26	1.8773	13 16 32.9	10.949
2	10 49 36.82	1.8746	13 5 34.4	11.001
3	10 51 29.21	1.8718	12 54 32.8	11.052
4	10 53 21.44	1.8692	12 43 28.2	11.102
5	10 55 13.51	1.8666	12 32 20.6	11.151
6	10 57 5.43	1.8641	12 21 10.1	11.199
7	10 58 57.20	1.8616	12 9 56.7	11.248
8	11 0 48.82	1.8591	11 58 40.4	11.296
9	11 2 40.29	1.8567	11 47 21.2	11.343
10	11 4 31.62	1.8544	11 35 59.2	11.389
11	11 6 22.82	1.8522	11 24 24.5	11.434
12	11 8 13.88	1.8499	11 13 7.2	11.478
13	11 10 4.81	1.8478	11 1 37.2	11.523
14	11 11 55.61	1.8457	10 50 4.5	11.567
15	11 13 46.29	1.8436	10 38 29.2	11.609
16	11 15 36.84	1.8416	10 26 51.4	11.651
17	11 17 27.28	1.8397	10 15 11.1	11.693
18	11 19 17.60	1.8378	10 3 28.2	11.735
19	11 21 7.81	1.8360	9 51 42.9	11.774
20	11 22 57.92	1.8342	9 39 55.3	11.813
21	11 24 47.92	1.8325	9 28 5.3	11.852
22	11 26 37.82	1.8309	9 16 13.0	11.891
23	11 28 27.63	1.8293	N. 9 4 18.4	11.928

THURSDAY, JANUARY 1, 1891.

0	11 30 17.34	1.8277	N. 8 52 21.6	11.965

PHASES OF THE MOON.

	d	h	m
☾ Last Quarter . . Dec.	4	1	26.6
● New Moon	11	15	10.9
☽ First Quarter. . . .	18	8	36.3
○ Full Moon	25	17	57.0

	d	h
☾ Apogee . . . . Dce.	2	18.4
☾ Perigee	14	12.6
☾ Apogee	30	14.0

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	α Arietis	W.	89° 9′ 22″	3143	90° 36′ 39″	3150	92° 3′ 48″	3156	93° 30′ 50″	3162
	Aldebaran	W.	58 27 39	3048	59 56 52	3054	61 25 58	3059	62 54 58	3064
	SATURN	E.	40 33 56	3063	39 5 1	3070	37 36 15	3078	36 7 38	3085
	Spica	E.	76 30 9	3054	75 1 3	3060	73 32 5	3067	72 3 16	3073
	SUN	E.	123 11 9	3411	121 49 5	3417	120 27 8	3423	119 5 18	3429
2	Aldebaran	W.	70 18 34	3084	71 47 3	3086	73 15 30	3088	74 43 54	3090
	Pollux	W.	26 9 27	3105	27 37 30	3104	29 5 34	3103	30 33 39	3102
	SATURN	E.	28 46 40	3119	27 18 53	3125	25 51 14	3131	24 23 42	3140
	Spica	E.	64 40 50	3099	63 12 37	3103	61 44 29	3107	60 16 26	3109
	SUN	E.	112 17 42	3454	110 56 26	3457	109 35 13	3460	108 14 4	3462
3	Aldebaran	W.	82 5 30	3092	83 33 49	3091	85 2 9	3090	86 30 31	3088
	Pollux	W.	37 54 18	3097	39 22 31	3095	40 50 46	3093	42 19 5	3090
	Spica	E.	52 56 56	3118	51 29 8	3118	50 1 21	3119	48 33 34	3119
	SUN	E.	101 28 41	3465	100 7 38	3464	98 46 34	3463	97 25 28	3460
4	Aldebaran	W.	93 53 6	3072	95 21 50	3067	96 50 41	3062	98 19 37	3056
	Pollux	W.	49 41 40	3069	51 10 27	3063	52 39 21	3056	54 8 22	3051
	Regulus	W.	14 11 20	3264	15 36 14	3235	17 1 41	3281	18 27 40	3182
	Spica	E.	41 14 44	3117	39 46 55	3117	38 19 5	3116	36 51 14	3115
	SUN	E.	90 39 11	3443	89 17 43	3437	87 56 8	3431	86 34 27	3425
5	Pollux	W.	61 35 33	3014	63 5 29	3005	64 35 36	2996	66 5 54	2985
	Regulus	W.	25 45 9	3076	27 13 48	3059	28 42 48	3044	30 12 6	3030
	Spica	E.	29 31 54	3118	28 4 6	3119	26 36 20	3124	25 8 40	3131
	SUN	E.	79 44 1	3386	78 21 28	3376	76 58 44	3366	75 35 48	3356
6	Pollux	W.	73 40 40	2931	75 12 20	2919	76 44 16	2906	78 16 27	2893
	Regulus	W.	37 43 1	2958	39 14 6	2944	40 45 28	2929	42 17 9	2915
	SATURN	W.	19 14 48	3003	20 44 57	2982	22 15 31	2962	23 46 31	2943
	SUN	E.	68 38 0	3297	67 13 45	3284	65 49 14	3270	64 24 27	3256
7	Pollux	W.	86 1 37	2825	87 35 33	2810	89 9 48	2795	90 44 22	2780
	Regulus	W.	50 0 17	2840	51 33 53	2824	53 7 49	2808	54 42 5	2792
	SATURN	W.	31 27 11	2857	23 0 25	2840	34 34 2	2823	36 8 0	2806
	SUN	E.	57 16 21	3182	55 49 50	3166	54 23 0	3150	52 55 51	3134
8	Pollux	W.	98 42 14	2702	100 18 51	2687	101 55 49	2671	103 33 8	2655
	Regulus	W.	62 38 43	2712	64 15 7	2696	65 51 53	2680	67 29 2	2663
	SATURN	W.	44 3 21	2722	45 39 32	2705	47 16 5	2687	48 53 2	2671
	SUN	E.	45 35 3	3049	44 5 51	3032	42 36 17	3015	41 6 23	2998
9	Regulus	W.	75 40 16	2580	77 19 39	2564	78 59 24	2548	80 39 30	2532
	SATURN	W.	57 3 25	2587	58 42 38	2570	60 22 14	2554	62 2 12	2537
	SUN	E.	33 31 20	2910	31 59 14	2893	30 26 45	2875	28 53 54	2859
13	SUN	W.	18 18 28	2507	19 59 32	2502	21 40 43	2497	23 22 1	2493
	Fomalhaut	E.	54 35 29	2459	52 53 18	2467	51 11 19	2478	49 29 35	2491
	α Pegasi	E.	74 7 31	2646	72 29 38	2652	70 51 53	2657	69 14 16	2666
14	SUN	W.	31 49 34	2482	33 31 13	2482	35 12 52	2482	36 54 31	2482

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	α Arietis	W.	94° 57′ 45″	3168	96° 24′ 33″	3173	97° 51′ 14″	3178	99° 17′ 50″	3184
	Aldebaran	W.	64 23 52	3069	65 52 39	3073	67 21 22	3077	68 50 0	3080
	SATURN	E.	34 39 10	3092	33 10 51	3098	31 42 39	3105	30 14 36	3111
	Spica	E.	70 34 33	3079	69 5 58	3085	67 37 28	3090	66 9 7	3095
	SUN	E.	117 43 35	3435	116 21 59	3441	115 0 28	3446	113 39 3	3450
2	Aldebaran	W.	76 12 15	3091	77 40 35	3092	79 8 54	3093	80 37 12	3093
	Pollux	W.	32 1 44	3102	33 29 51	3101	34 57 58	3100	36 26 7	3098
	SATURN	E.	22 56 20	3149	21 29 10	3158	20 2 10	3165	18 35 19	3174
	Spica	E.	58 48 26	3111	57 20 30	3113	55 52 36	3115	54 24 45	3117
	SUN	E.	106 52 56	3463	105 31 51	3464	104 10 47	3465	102 49 44	3465
3	Aldebaran	W.	87 58 55	3086	89 27 22	3083	90 55 52	3080	92 24 26	3076
	Pollux	W.	43 47 27	3087	45 15 53	3083	46 44 24	3079	48 12 59	3075
	Spica	E.	47 5 50	3119	45 38 4	3119	44 10 18	3118	42 42 31	3118
	SUN	E.	96 4 19	3458	94 43 8	3454	93 21 53	3451	92 0 35	3447
4	Aldebaran	W.	99 48 40	3049	101 17 52	3043	102 47 11	3036	104 16 39	3029
	Pollux	W.	55 37 31	3045	57 6 48	3039	58 36 13	3030	60 5 48	3022
	Regulus	W.	19 54 13	3156	21 21 20	3130	22 48 54	3110	24 16 52	3094
	Spica	E.	35 23 23	3114	33 55 31	3115	32 27 38	3116	30 59 45	3117
	SUN	E.	85 12 38	3418	83 50 42	3410	82 28 38	3402	81 6 24	3394
5	Pollux	W.	67 36 25	2976	69 7 8	2965	70 38 4	2955	72 9 15	2943
	Regulus	W.	31 41 41	3016	33 11 34	3002	34 41 46	2988	36 12 14	2973
	Spica	E.	23 41 7	3145	22 13 52	3161	20 46 56	3175	19 20 17	3191
	SUN	E.	74 12 41	3345	72 49 21	3333	71 25 48	3321	70 2 1	3309
6	Pollux	W.	79 48 54	2880	81 21 38	2867	82 54 40	2853	84 27 59	2839
	Regulus	W.	43 49 9	2901	45 21 27	2886	46 54 4	2871	48 27 1	2856
	SATURN	W.	25 17 53	2925	26 49 40	2908	28 21 48	2891	29 54 19	2874
	SUN	E.	62 59 24	3242	61 34 5	3228	60 8 26	3213	58 42 34	3198
7	Pollux	W.	92 19 16	2765	93 54 30	2750	95 30 4	2734	97 5 59	2718
	Regulus	W.	56 16 42	2776	57 51 41	2760	59 27 0	2744	61 2 41	2728
	SATURN	W.	37 42 20	2789	39 17 2	2772	40 52 6	2756	42 27 32	2739
	SUN	E.	51 28 22	3117	50 0 33	3100	48 32 23	3083	47 3 53	3066
8	Pollux	W.	105 10 49	2639	106 48 51	2623	108 27 16	2607	110 6 2	2591
	Regulus	W.	69 6 32	2646	70 44 24	2630	72 22 39	2614	74 1 17	2597
	SATURN	W.	50 30 21	2655	52 8 2	2638	53 46 7	2621	55 24 34	2604
	SUN	E.	39 36 6	2980	38 5 28	2963	36 34 27	2945	35 3 5	2928
9	Regulus	W.	82 20 0	2516	84 0 51	2501	85 42 4	2485	87 23 39	2470
	SATURN	W.	63 42 33	2521	65 23 17	2505	67 4 22	2489	68 45 50	2474
	SUN	E.	27 20 41	2842	25 47 7	2825	24 13 10	2808	22 38 52	2792
13	SUN	W.	25 3 24	2490	26 44 51	2487	28 26 23	2485	30 7 58	2483
	Fomalhaut	E.	47 48 9	2506	46 7 6	2525	44 26 28	2546	42 46 19	2572
	α Pegasi	E.	67 36 50	2676	65 59 38	2687	64 22 41	2701	62 46 3	2717
14	SUN	W.	38 36 10	2483	40 17 47	2485	41 59 22	2487	43 40 54	2489

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	III^{h}.	P. L. of Diff.	VI^{h}.	P. L of Diff.	IX^{h}.	P. L. of Diff.
14	Fomalhaut E.	41° 6′ 46″	2602	39° 27′ 54″	2637	37° 49′ 49″	2676	36° 12′ 37″	2722
	α Pegasi E.	61 9 46	2737	59 33 55	2757	57 58 31	2782	56 23 39	2808
	α Arietis E.	102 21 37	2289	100 35 22	2288	98 49 5	2287	97 2 47	2286
15	Sun W.	45 22 23	2492	47 3 48	2495	48 45 9	2499	50 26 24	2502
	α Pegasi E.	48 39 35	3002	47 9 25	3056	45 40 21	3115	44 12 30	3180
	α Arietis E.	88 11 21	2294	86 25 13	2298	84 39 10	2302	82 53 13	2306
16	Sun W.	58 51 6	2528	60 31 40	2534	62 12 5	2540	63 52 22	2547
	α Aquilæ W.	40 44 48	4696	41 45 45	4528	42 49 10	4378	43 54 51	4244
	α Arietis E.	74 5 27	2339	72 20 21	2347	70 35 33	2356	68 50 55	2365
	Aldebaran E.	104 23 42	2228	102 35 56	2233	100 48 18	2239	99 0 49	2245
17	Sun W.	72 11 19	2585	73 50 35	2593	75 29 40	2601	77 8 35	2609
	α Aquilæ W.	49 50 57	3763	51 6 38	3695	52 23 30	3635	53 41 26	3582
	Jupiter W.	26 33 37	2367	28 17 59	2371	30 2 17	2376	31 46 30	2380
	α Arietis E.	60 11 27	2422	58 28 24	2436	56 45 41	2450	55 3 18	2466
	Aldebaran E.	90 5 43	2279	88 19 13	2286	86 32 54	2294	84 46 45	2302
18	Sun W.	85 20 13	2652	86 57 57	2661	88 35 29	2670	90 12 50	2679
	α Aquilæ W.	60 23 51	3395	61 46 20	3363	63 9 19	3340	64 32 44	3319
	Jupiter W.	40 25 35	2409	42 8 57	2416	43 52 8	2423	45 35 9	2431
	α Arietis E.	46 37 14	2559	44 57 22	2582	43 18 2	2607	41 39 16	2634
	Aldebaran E.	75 58 58	2343	74 14 1	2351	72 29 16	2360	70 44 43	2369
19	Sun W.	98 16 27	2725	99 52 34	2734	101 28 28	2743	103 4 11	2752
	α Aquilæ W.	71 34 50	3254	72 59 55	3247	74 25 12	3240	75 50 35	3235
	Jupiter W.	54 7 30	2470	55 49 25	2478	57 31 8	2486	59 12 39	2495
	Fomalhaut W.	36 22 22	2899	37 54 42	2869	39 27 41	2845	41 1 11	2824
	Mars W.	34 13 32	2668	35 50 55	2675	37 28 9	2682	39 5 14	2689
	Aldebaran E.	62 5 12	2413	60 21 56	2423	58 38 54	2432	56 56 5	2441
	Pollux E.	106 14 22	2402	104 30 50	2410	102 47 29	2419	101 4 21	2427
20	Sun W.	110 59 40	2799	112 34 9	2808	114 8 27	2817	115 42 32	2826
	α Aquilæ W.	82 58 1	3235	84 23 27	3240	85 48 48	3245	87 14 4	3253
	Jupiter W.	67 37 21	2537	69 17 43	2545	70 57 53	2553	72 37 51	2562
	Fomalhaut W.	48 54 3	2764	50 29 18	2759	52 4 42	2753	53 40 11	2750
	Mars W.	47 8 11	2726	48 44 16	2734	50 20 9	2742	51 55 52	2750
	α Pegasi W.	36 8 20	3905	37 21 35	3804	38 36 33	3715	39 53 4	3637
	Aldebaran E.	48 25 21	2489	46 43 53	2500	45 2 39	2511	43 21 41	2521
	Pollux E.	92 31 38	2470	90 49 42	2478	89 7 57	2487	87 26 24	2495
21	α Aquilæ W.	94 18 6	3300	95 42 18	3312	97 6 16	3326	98 29 57	3341
	Jupiter W.	80 54 48	2604	82 33 37	2612	84 12 14	2620	85 50 40	2629
	Fomalhaut W.	61 38 17	2748	63 13 53	2750	64 49 27	2752	66 24 57	2755
	Mars W.	59 51 44	2792	61 26 22	2800	63 0 49	2808	64 35 4	2817
	α Pegasi W.	46 33 25	3374	47 56 11	3337	49 19 40	3306	50 43 44	3279
	Aldebaran E.	35 0 32	2578	33 21 7	2590	31 42 0	2604	30 3 11	2619
	Pollux E.	79 1 35	2536	77 21 12	2544	75 41 1	2553	74 1 2	2561
	Regulus E.	115 5 31	2545	113 25 20	2553	111 45 20	2561	110 5 31	2569
22	Fomalhaut W.	74 21 17	2778	75 56 14	2784	77 31 4	2790	79 5 46	2796

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
14	Fomalhaut	E.	34 36 27	2779	33 1 32	2842	31 27 58	2917	29 56 0	3007
	α Pegasi	E.	54 49 22	2838	53 15 44	2872	51 42 49	2912	50 10 46	2954
	α Arietis	E.	95 16 26	2287	93 30 8	2288	91 43 50	2289	89 57 34	2291
15	Sun	W.	52 7 34	2507	53 48 38	2512	55 29 34	2517	57 10 24	2522
	α Pegasi	E.	42 46 0	3255	41 20 56	3339	39 57 30	3435	38 35 53	3543
	α Arietis	E.	81 7 22	2312	79 21 40	2318	77 36 7	2324	75 50 42	2331
16	Sun	W.	65 32 29	2554	67 12 27	2561	68 52 14	2569	70 31 52	2577
	α Aquilæ	W.	45 2 36	4194	46 12 15	4018	47 23 37	3922	48 36 34	3838
	α Arietis	E.	67 6 31	2375	65 22 21	2386	63 38 26	2398	61 54 49	2410
	Aldebaran	E.	97 13 28	2251	95 26 16	2258	93 39 15	2265	91 52 23	2272
17	Sun	W.	78 47 18	2618	80 25 49	2626	82 4 9	2634	83 42 17	2643
	α Aquilæ	W.	55 0 20	3534	56 20 7	3492	57 40 40	3453	59 1 57	3420
	Jupiter	W.	33 30 35	2384	35 14 33	2390	36 58 23	2396	38 42 4	2402
	α Arietis	E.	53 21 16	2482	51 39 38	2499	49 58 24	2517	48 17 35	2538
	Aldebaran	E.	83 0 48	2310	81 15 3	2318	79 29 29	2326	77 44 8	2334
18	Sun	W.	91 49 58	2689	93 26 53	2698	95 3 37	2707	96 40 8	2716
	α Aquilæ	W.	65 56 33	3300	67 20 44	3387	68 45 11	3273	70 9 54	3264
	Jupiter	W.	47 18 0	2439	49 0 39	2446	50 43 8	2453	52 25 24	2461
	α Arietis	E.	40 1 7	2664	38 23 39	2697	36 46 55	2733	35 10 59	2773
	Aldebaran	E.	69 0 23	2378	67 16 16	2386	65 32 22	2395	63 48 40	2404
19	Sun	W.	104 39 41	2762	106 14 59	2771	107 50 4	2780	109 24 57	2789
	α Aquilæ	W.	77 16 0	3233	78 41 30	3232	80 7 1	3232	81 32 32	3233
	Jupiter	W.	60 53 59	2504	62 35 7	2512	64 16 3	2520	65 56 48	2528
	Fomalhaut	W.	42 35 8	2807	44 9 27	2792	45 44 5	2781	47 18 58	2772
	Mars	W.	40 42 10	2696	42 18 55	2703	43 55 31	2710	45 31 56	2718
	Aldebaran	E.	55 13 29	2450	53 31 6	2460	51 48 57	2470	50 7 2	2479
	Pollux	E.	99 21 24	2436	97 38 40	2444	95 56 8	2453	94 13 47	2461
20	Sun	W.	117 16 26	2835	118 50 8	2844	120 23 38	2854	121 56 56	2863
	α Aquilæ	W.	88 39 12	3259	90 4 11	3267	91 29 1	3277	92 53 39	3288
	Jupiter	W.	74 17 38	2571	75 57 12	2579	77 36 36	2587	79 15 47	2595
	Fomalhaut	W.	55 15 45	2747	56 51 22	2747	58 27 0	2746	60 2 39	2747
	Mars	W.	53 31 24	2759	55 6 46	2767	56 41 56	2775	58 16 56	2783
	α Pegasi	W.	41 10 58	3569	42 30 5	3511	43 50 17	3459	45 11 26	3414
	Aldebaran	E.	41 40 56	2532	40 0 27	2542	38 20 13	2553	36 40 14	2565
	Pollux	E.	85 45 2	2503	84 3 53	2511	82 22 55	2520	80 42 9	2528
21	α Aquilæ	W.	99 53 21	3358	101 16 27	3375	102 39 12	3394	104 1 35	3414
	Jupiter	W.	87 28 55	2638	89 6 58	2646	90 44 49	2654	92 22 30	2663
	Fomalhaut	W.	68 0 24	2759	69 35 45	2763	71 11 2	2767	72 46 13	2772
	Mars	W.	66 9 9	2826	67 43 3	2835	69 16 46	2843	70 50 18	2852
	α Pegasi	W.	52 8 20	3255	53 33 24	3234	54 58 53	3216	56 24 43	3200
	Aldebaran	E.	28 24 42	2636	26 46 36	2653	25 8 52	2672	23 31 35	2692
	Pollux	E.	72 21 14	2570	70 41 38	2578	69 2 13	2587	67 23 0	2595
	Regulus	E.	108 25 53	2577	106 46 26	2585	105 7 10	2593	103 28 4	2601
22	Fomalhaut	W.	80 40 20	2802	82 14 45	2809	83 49 1	2816	85 23 8	2823

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
22	α Pegasi	W.	57° 50′ 52″	3186	59° 17′ 18″	3174	60° 43′ 58″	3163	62° 10′ 50″	3154
	Pollux	E.	65 43 59	2604	64 5 9	2612	62 26 31	2621	60 48 5	2629
	Regulus	E.	101 49 10	2608	100 10 26	2616	98 31 54	2625	96 53 33	2633
23	Fomalhaut	W.	86 57 5	2831	88 30 52	2839	90 4 28	2848	91 37 54	2857
	α Pegasi	W.	69 27 4	3135	70 54 31	3133	72 22 0	3133	73 49 28	3133
	α Arietis	W.	25 56 55	3313	27 20 51	3254	28 45 56	3206	30 11 59	3166
	Pollux	E.	52 38 48	2674	51 1 33	2683	49 24 29	2692	47 47 38	2700
	Regulus	E.	88 44 32	2675	87 7 18	2684	85 30 15	2692	83 53 23	2700
24	Fomalhaut	W.	99 22 7	2905	100 54 20	2915	102 26 20	2926	103 58 7	2937
	α Pegasi	W.	81 6 16	3152	82 33 23	3157	84 0 24	3163	85 27 18	3170
	α Arietis	W.	37 31 58	3046	39 1 15	3033	40 30 47	3022	42 0 32	3014
	Pollux	E.	39 46 26	2748	38 10 50	2758	36 35 27	2768	35 0 17	2779
	Regulus	E.	75 51 54	2742	74 16 10	2751	72 40 38	2760	71 5 18	2769
25	α Pegasi	W.	92 39 34	3211	94 5 30	3221	95 31 13	3232	96 56 44	3244
	α Arietis	W.	49 31 6	2997	51 1 23	2997	52 31 40	2997	54 1 56	2999
	Pollux	E.	27 8 6	2838	25 34 30	2851	24 1 9	2866	22 28 4	2884
	Regulus	E.	63 11 32	2814	61 37 22	2823	60 3 24	2832	58 29 38	2841
26	α Arietis	W.	61 32 35	3015	63 2 29	3019	64 32 18	3023	66 2 2	3028
	Aldebaran	W.	30 14 32	2924	31 46 20	2928	33 18 3	2932	34 49 41	2937
	Regulus	E.	50 43 48	2889	49 11 15	2898	47 38 53	2908	46 6 45	2918
	Spica	E.	104 46 38	2893	103 14 10	2901	101 41 51	2909	100 9 43	2917
27	α Arietis	W.	73 29 0	3057	74 58 2	3063	76 26 57	3069	77 55 44	3075
	Aldebaran	W.	42 26 13	2965	43 57 10	2971	45 27 59	2977	46 58 40	2983
	Regulus	E.	38 29 10	2968	36 58 17	2979	35 27 38	2990	33 57 13	3002
	Spica	E.	92 31 36	2957	91 0 29	2965	89 29 32	2973	87 58 45	2981
28	α Arietis	W.	85 17 42	3108	86 45 42	3114	88 13 34	3120	89 41 19	3126
	Aldebaran	W.	54 30 8	3014	56 0 3	3020	57 29 50	3026	58 59 30	3032
	Regulus	E.	26 28 46	3067	24 59 56	3082	23 31 24	3098	22 3 12	3118
	Spica	E.	80 27 11	3018	78 57 20	3025	77 27 37	3032	75 58 4	3039
29	Aldebaran	W.	66 26 8	3059	67 55 8	3063	69 24 2	3068	70 52 51	3071
	Pollux	W.	22 19 8	3094	23 47 25	3093	25 15 43	3092	26 44 3	3091
	Spica	E.	68 32 15	3069	67 3 28	3075	65 34 48	3081	64 6 14	3085
	VENUS	E.	110 20 3	3117	108 52 14	3123	107 24 30	3129	105 56 55	3135
30	Aldebaran	W.	78 15 51	3088	79 44 15	3090	81 12 36	3093	82 40 55	3095
	Pollux	W.	34 5 29	3096	35 33 43	3097	37 1 56	3098	38 30 8	3099
	Spica	E.	56 44 57	3109	55 16 58	3113	53 49 3	3116	52 21 12	3119
	VENUS	E.	98 40 41	3161	97 13 45	3165	95 46 54	3169	94 20 8	3173
	SUN	E.	132 39 21	3466	131 18 19	3469	129 57 20	3471	128 36 24	3473
31	Aldebaran	W.	90 2 7	3097	91 30 20	3096	92 58 34	3096	94 26 49	3095
	Pollux	W.	45 51 7	3096	47 19 21	3095	48 47 36	3094	50 15 53	3092
	Spica	E.	45 2 57	3133	43 35 28	3136	42 8 1	3138	40 40 37	3141
	VENUS	E.	87 7 15	3185	85 40 48	3187	84 14 23	3187	82 47 58	3186
	SUN	E.	121 52 4	3476	120 31 13	3475	119 10 21	3474	117 49 29	3472

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
22	α Pegasi	W.	63° 37′ 51″	3148	65° 5′ 1″	3143	66° 32′ 17″	3139	67° 59′ 39″	3137
	Pollux	E.	59 9 50	2638	57 31 47	2647	55 53 56	2656	54 16 16	2665
	Regulus	E.	95 15 23	2641	93 37 23	2649	91 59 35	2657	90 21 58	2666
23	Fomalhaut	W.	93 11 8	2866	94 44 11	2875	96 17 2	2885	97 49 41	2895
	α Pegasi	W.	75 16 57	3135	76 44 22	3139	78 11 44	3143	79 39 2	3146
	α Arietis	W.	31 38 49	3130	33 6 22	3102	34 34 28	3080	36 3 2	3062
	Pollux	E.	46 10 58	2710	44 34 31	2719	42 58 17	2729	41 22 15	2737
	Regulus	E.	82 16 42	2708	80 40 13	2716	79 3 55	2724	77 27 49	2733
24	Fomalhaut	W.	105 29 39	2948	107 0 57	2960	108 32 0	2973	110 2 47	2985
	α Pegasi	W.	86 54 5	3177	88 20 42	3185	89 47 9	3193	91 13 27	3202
	α Arietis	W.	43 30 27	3009	45 0 29	3003	46 30 38	3000	48 0 51	2998
	Pollux	E.	33 25 22	2790	31 50 41	2801	30 16 14	2812	28 42 2	2825
	Regulus	E.	69 30 9	2778	67 55 12	2787	66 20 27	2796	64 45 53	2805
25	α Pegasi	W.	98 22 1	3256	99 47 4	3269	101 11 52	3282	102 36 25	3296
	α Arietis	W.	55 32 10	3001	57 2 22	3003	58 32 31	3006	60 2 35	3010
	Pollux	E.	20 55 22	2904	19 23 8	2924	17 51 20	2944	16 19 57	2965
	Regulus	E.	56 56 4	2850	55 22 41	2859	53 49 31	2869	52 16 34	2879
26	α Arietis	W.	67 31 39	3034	69 1 10	3039	70 30 34	3045	71 59 51	3051
	Aldebaran	W.	36 21 13	2942	37 52 38	2947	39 23 57	2953	40 55 8	2959
	Regulus	E.	44 34 48	2928	43 3 5	2938	41 31 34	2948	40 0 15	2958
	Spica	E.	98 37 45	2924	97 5 57	2932	95 34 20	2941	94 2 53	2949
27	α Arietis	W.	79 24 23	3082	80 52 55	3088	82 21 18	3095	83 49 34	3101
	Aldebaran	W.	48 29 13	2989	49 59 39	2995	51 29 56	3001	53 0 6	3007
	Regulus	E.	32 27 1	3014	30 57 5	3025	29 27 23	3037	27 57 56	3052
	Spica	E.	86 28 7	2989	84 57 40	2997	83 27 21	3004	81 57 11	3011
28	α Arietis	W.	91 8 55	3133	92 36 24	3139	94 3 45	3145	95 31 0	3152
	Aldebaran	W.	60 29 3	3038	61 58 29	3045	63 27 48	3051	64 57 1	3055
	Regulus	E.	20 35 26	3142	19 8 11	3168	17 41 28	3194	16 15 16	3220
	Spica	E.	74 28 38	3045	72 59 21	3051	71 30 11	3057	70 1 10	3063
29	Aldebaran	W.	72 21 36	3075	73 50 16	3079	75 18 51	3082	76 47 23	3085
	Pollux	W.	28 12 23	3092	29 40 41	3093	31 8 58	3094	32 37 15	3095
	Spica	E.	62 37 47	3091	61 9 26	3096	59 41 11	3101	58 13 1	3105
	Venus	E.	104 29 26	3141	103 2 4	3146	101 34 50	3151	100 7 43	3156
30	Aldebaran	W.	84 9 12	3096	85 37 28	3097	87 5 41	3097	88 33 54	3097
	Pollux	W.	39 58 20	3099	41 26 31	3099	42 54 43	3098	44 22 54	3097
	Spica	E.	50 53 26	3122	49 25 44	3125	47 58 5	3128	46 30 30	3131
	Venus	E.	92 53 27	3176	91 26 49	3179	90 0 15	3181	88 33 43	3183
	Sun	E.	127 15 30	3474	125 54 37	3475	124 33 45	3476	123 12 54	3476
31	Aldebaran	W.	95 55 5	3093	97 23 24	3091	98 51 45	3088	100 20 10	3085
	Pollux	W.	51 44 13	3089	53 12 36	3086	54 41 2	3083	56 9 32	3080
	Spica	E.	39 13 16	3143	37 45 58	3146	36 18 42	3148	34 51 29	3151
	Venus	E.	81 21 32	3186	79 55 6	3186	78 28 41	3187	77 2 16	3188
	Sun	E.	116 28 34	3471	115 7 37	3469	113 46 38	3466	112 25 35	3462

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	19 49 56.32	+16.839	−23 9 24.2	+50.21	1 5.7
2	19 56 37.90	16.621	22 48 35.0	53.87	1 8.5
3	20 3 13.79	16.364	22 26 19.5	57.40	1 11.1
4	20 9 43.02	16.064	22 2 41.0	60.78	1 13.6
5	20 16 4.48	15.716	21 37 43.5	63.97	1 16.0
6	20 22 16.94	+15.313	−21 11 32.2	+66.93	1 18.3
7	20 28 19.01	14.848	20 44 13.3	69.60	1 20.4
8	20 34 9.09	14.313	20 15 54.4	71.92	1 22.3
9	20 39 45.41	13.700	19 46 44.7	73.84	1 24.0
10	20 45 5.98	12.999	19 16 54.9	75.26	1 25.3
11	20 50 8.57	+12.201	−18 46 37.4	+76.11	1 26.4
12	20 54 50.77	11.297	18 16 6.8	76.32	1 27.2
13	20 59 9.92	10.278	17 45 39.8	75.80	1 27.5
14	21 3 3.15	9.137	17 15 35.0	74.46	1 27.4
15	21 6 27.46	7.867	16 46 13.0	72.21	1 26.9
16	21 9 19.74	+ 6.467	−16 17 56.6	+68.99	1 25.8
17	21 11 36.87	4.938	15 51 9.6	64.75	1 24.1
18	21 13 15.84	3.290	15 26 16.9	59.46	1 21.7
19	21 14 13.94	+ 1.536	15 3 43.6	53.14	1 18.7
20	21 14 28.92	− 0.299	14 43 54.1	45.83	1 15.0
21	21 13 59.24	− 2.181	−14 27 10.7	+37.66	1 10.5
22	21 12 44.25	4.066	14 13 52.1	28.79	1 5.3
23	21 10 44.48	5.902	14 4 12.8	19.42	0 59.4
24	21 8 1.83	7.629	13 58 21.5	9.84	0 52.7
25	21 4 39.66	9.184	13 56 19.6	+ 0.36	0 45.4
26	21 0 42.84	−10.506	−13 58 1.1	− 8.72	0 37.6
27	20 56 17.65	11.540	14 3 12.9	17.12	0 29.3
28	20 51 31.56	12.243	14 11 35.2	24.55	0 20.6
29	20 46 32.80	12.593	14 22 42.3	30.85	0 11.7
30	20 41 29.92	12.586	14 36 5.8	35.88	0 2.8 23 54.0
31	20 36 31.35	−12.239	−14 51 14.4	−39.63	23 45.3
32	20 31 44.88	−11.586	−15 7 38.2	−42.15	23 36.9

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	2″.6	2″.9	3″.2	3″.7	4″.3	4″.9	5″.1
Hor. Parallax . .	7.0	7.6	8.5	9.7	11.3	12.9	13.5

FEBRUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	20 31 44.88	−11.586	−15 7 38.2	−42.15	23 36.9
2	20 27 17.28	10.672	15 24 48.8	43.52	23 28.9
3	20 23 14.18	9.554	15 42 19.3	43.90	23 21.5
4	20 19 39.86	8.286	15 59 48.7	43.42	23 14.6
5	20 16 37.25	6.920	16 16 58.1	42.25	23 8.1
6	20 14 8.09	− 5.505	−16 33 32.4	−40.53	23 2.2
7	20 12 13.09	4.079	16 49 19.9	38.36	22 56.9
8	20 10 52.17	2.672	17 4 11.1	35.86	22 52.2
9	20 10 4.52	1.308	17 17 59.2	33.11	22 48.0
10	20 9 48.89	− 0.006	17 30 38.6	30.15	22 44.3
11	20 10 3.69	+ 1.227	−17 42 5.4	−27.06	22 41.0
12	20 10 47.17	2.388	17 52 16.6	23.86	22 38.2
13	20 11 57.42	3.459	18 1 10.2	20.59	22 35.8
14	20 13 32.57	4.457	18 8 44.6	17.26	22 33.8
15	20 15 30.76	5.378	18 14 58.4	13.89	22 32.2
16	20 17 50.15	+ 6.227	−18 19 51.1	−10.49	22 30 9
17	20 20 29.06	7.005	18 23 21.9	7.07	22 29.9
18	20 23 25.87	7.718	18 25 30.5	3.64	22 29.1
19	20 26 39.06	8.372	18 26 16.7	− 0.21	22 28.6
20	20 30 7.30	8.971	18 25 40.5	+ 3.23	22 28.4
21	20 33 49.27	+ 9.518	−18 23 41.9	+ 6.67	22 28.4
22	20 37 43.80	10.019	18 20 20.7	10.10	22 28.5
23	20 41 49.84	10.479	18 15 37.2	13.52	22 28.8
24	20 46 6.41	10.897	18 9 31.6	16.94	22 29.3
25	20 50 32.63	11.282	18 2 4.1	20.35	22 29.9
26	20 55 7.70	+11.635	−17 53 14.9	+23.75	22 30.7
27	20 59 50.89	11.958	17 43 4.1	27.14	22 31.6
28	21 4 41.50	12.256	17 31 32.3	30.51	22 32.6
29	21 9 38.98	12.531	17 18 39.7	33.87	22 33.7
30	21 14 42.80	12.785	17 4 26.6	37.22	22 34.9
31	21 19 52.47	+13.018	−16 48 53.4	+40.55	22 36.2
32	21 25 7.54	+13.235	−16 32 0.3	+43.87	22 37.6

Day of the Month.	5th.	10th.	15th.	20th.	25th.
Semidiameter.	4″.9	4″.5	4″.1	3″.7	3″.4
Hor. Parallax	13.0	11.9	10.8	9.8	9.0

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

MARCH.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Honr. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	21 9 38.98	+12.531	−17 18 39.7	+ 33.87	22 33.7
2	21 14 42.80	12.785	17 4 26.6	37.22	22 34.9
3	21 19 52.47	13.018	16 48 53.4	40.55	22 36.2
4	21 25 7.54	13.235	16 32 0.3	43 87	22 37.6
5	21 30 27.63	13.435	16 13 47.8	47.17	22 39.1
6	21 35 52.40	+13.625	−15 54 16.1	+ 50.46	22 40.6
7	21 41 21.53	13.801	15 33 25.7	53.73	22 42.2
8	21 46 54.75	13.966	15 11 17.0	56.98	22 43.9
9	21 52 31.83	14.122	14 47 50.6	60.22	22 45.6
10	21 58 12.54	14.269	14 23 6.6	63.44	22 47.5
11	22 3 56.71	+14.410	−13 57 5.4	+ 66.65	22 49.3
12	22 9 44.19	14.545	13 29 47.5	69.83	22 51.2
13	22 15 34.85	14.675	13 1 13.5	73.00	22 53.2
14	22 21 28.58	14.802	12 31 23.8	76.14	22 55.2
15	22 27 25.30	14.925	12 0 18.8	79.27	22 57.2
16	22 33 24.96	+15.046	−11 27 58.9	+ 82.38	22 59.3
17	22 39 27.51	15.166	10 54 24.8	85.46	23 1.5
18	22 45 32.94	15.286	10 19 36.9	88.52	23 3.7
19	22 51 41.25	15.406	9 43 35.8	91.56	23 5.9
20	22 57 52.46	15.528	9 6 22.0	94.58	23 8.2
21	23 4 6.60	+15.651	− 8 27 56.2	+ 97.56	23 10.6
22	23 10 23.74	15.778	7 48 19.2	100.52	23 13.0
23	23 16 43.94	15.906	7 7 31.7	103.44	23 15.4
24	23 23 7.28	16.039	6 25 34.5	106.32	23 17.9
25	23 29 33.87	16.177	5 42 28.5	109.17	23 20.5
26	23 36 3.83	+16.320	− 4 58 14.7	+111.97	23 23.1
27	23 42 37.28	16.468	4 12 54.3	114.72	23 25.8
28	23 49 14.37	16.623	3 26 28.7	117.41	23 27.5
29	23 55 55.22	16.783	2 38 59.4	120.03	23 31.3
30	0 2 39.99	16.949	1 50 28.1	122.56	23 34.2
31	0 9 28.84	+17.122	− 1 0 57.1	+125.01	23 37.2
32	0 16 21.91	+17.301	− 0 10 28.5	+127.36	23 40.2

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter . .	3″.2	3″.0	2″.8	2″.7	2″.6	2″.5
Hor. Parallax . .	8.4	7.9	7.5	7.2	6.9	6.7

APRIL.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	0 16 21.91	+17.301	− 0 10 28.5	+127.36	23 40.2
2	0 23 19.33	17.485	+ 0 40 55.0	129.57	23 43.2
3	0 30 21.23	17.674	1 33 9.8	131.64	23 46.4
4	0 37 27.72	17.867	2 26 12.3	133.54	23 49.7
5	0 44 38.88	18.063	3 19 58.2	135.25	23 53.0
6	0 51 54.75	+18.259	+ 4 14 22.4	+136.75	23 56.4
7	0 59 15.31	18.454	5 9 19.2	137.97	23 59.9
8	1 6 40.50	18.644	6 4 41.9	138.89	
9	1 14 10.18	18.828	7 0 23.1	139.49	0 3.5
10	1 21 44.13	19.000	7 56 14.3	139.72	0 7.1
11	1 29 22.05	+19.156	+ 8 52 6.2	+139.54	0 10.8
12	1 37 3.48	19.293	9 47 48.5	138.91	0 14.5
13	1 44 47.92	19.406	10 43 10.1	137.81	0 18.3
14	1 52 34.75	19.488	11 37 59.2	136.20	0 22.2
15	2 0 23.07	19.536	12 32 3.3	134.06	0 26.1
16	2 8 12.13	+19.545	+13 25 9.8	+131.39	0 30.0
17	2 16 0.90	19.511	14 17 5.6	128.18	0 33.8
18	2 23 48.27	19.430	15 7 38.1	124.45	0 37.7
19	2 31 33.13	19.300	15 56 35.1	120.22	0 41.5
20	2 39 14.26	19.119	16 43 45.3	115.55	0 45.3
21	2 46 50.43	+18.887	+17 28 58.2	+110.47	0 49.0
22	2 54 20.42	18.604	18 12 5.0	105.04	0 52.5
23	3 1 43.04	18.272	18 52 57.7	99.31	0 55.9
24	3 8 57.10	17.892	19 31 30.1	93.35	0 59.2
25	3 16 1.48	17.466	20 7 37.3	87.23	1 2.4
26	3 22 55.14	+16.999	+20 41 16.2	+ 81.00	1 5.4
27	3 29 37.10	16.492	21 12 24.7	74.70	1 8.1
28	3 36 6.43	15.947	21 41 1.9	68.40	1 10.6
29	3 42 22.28	15.368	22 7 8.0	62.12	1 12.9
30	3 48 23.83	14.756	22 30 44.0	55.90	1 15.0
31	3 54 10.35	+14.116	+22 51 51.9	+ 49.77	1 16.8
32	3 59 41.16	+13.447	+23 10 34.0	+ 43.75	1 18.4

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.
Semidiameter . .	2″.5	2″.5	2″.5	2″.6	2″.8	3″.1
Hor. Parallax . .	6.6	6.6	6.7	7.0	7.5	8.2

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The — sign indicates that north declinations are decrêasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.	Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	3 54 10.35	+14.116	+22 51 51.9	+49.77	1 16.8	1	4 24 33.70	− 5.209	+18 49 3.8	−48.59	23 39.0
2	3 59 41.16	13.447	23 10 34.0	43.75	1 18.4	2	4 22 31.57	4.954	18 30 10.4	45.77	23 33.1
3	4 4 55.58	12.751	23 26 52.8	37.84	1 19.7	3	4 20 36.58	4.615	18 12 30.8	42.45	23 27.4
4	4 9 53.01	12.031	23 40 51.5	32.07	1 20.7	4	4 18 50.64	4.201	17 56 16.4	38.68	23 21.9
5	4 14 32.89	11.288	23 52 33.3	26.44	1 21.4	5	4 17 15.48	3.719	17 41 37.2	34.53	23 16.6
6	4 18 54.65	+10.522	+24 2 1.8	+20.95	1 21.8	6	4 15 52.65	− 3.177	+17 28 41.4	−30.07	23 11.6
7	4 22 57.78	9.735	24 9 20.2	15.61	1 21.8	7	4 14 43.46	2.583	17 17 35.7	25 36	23 6.7
8	4 26 41.80	8.930	24 14 32.1	10.40	1 21.6	8	4 13 49.02	1.947	17 8 25.5	20.47	23 2.1
9	4 30 6.27	8.106	24 17 40.6	5.33	1 21.1	9	4 13 10.28	1.276	17 1 14.1	15.46	22 57.8
10	4 33 10.77	7.266	24 18 49.2	+ 0.41	1 20.2	10	4 12 47.96	− 0.578	16 56 3.6	10.40	22 53.8
11	4 35 54.93	+ 6.412	+24 18 1.1	− 4.39	1 19.0	11	4 12 42.70	+ 0.141	+16 52 54.6	− 5.35	22 50.0
12	4 38 18.47	5.548	24 15 19.5	9.05	1 17.4	12	4 12 54.87	0.875	16 51 46.2	− 0.36	22 46.6
13	4 40 21.14	4.674	24 10 47.6	13.58	1 15.5	13	4 13 24.80	1.620	16 52 36.4	+ 4.52	22 43.4
14	4 42 2.79	3.797	24 4 28.6	17.98	1 13.2	14	4 14 12.68	2.371	16 55 22.2	9.27	22 40.6
15	4 43 23.39	2.920	23 56 25.8	22.23	1 10.6	15	4 15 18.62	3.125	16 59 59.9	13.84	22 38.0
16	4 44 22.97	+ 2.048	+23 46 42.7	−26.33	1 7.6	16	4 16 42.67	+ 3.879	+17 6 24.7	+18.19	22 35.8
17	4 45 1.76	1.188	23 35 23.1	30.27	1 4.3	17	4 18 24.81	4.632	17 14 31.2	22.31	22 33.8
18	4 45 20.10	+ 0.344	23 22 31.1	34.03	1 0.7	18	4 20 24.99	5.382	17 24 13.8	26.18	22 32.2
19	4 45 18.47	− 0.475	23 8 11.1	37.59	0 56.9	19	4 22 43.13	6.129	17 35 26.0	29.79	22 30.8
20	4 44 57.60	1.258	22 52 28.4	40.91	0 52.4	20	4 25 19.15	6.872	17 48 1.4	33.11	22 29.7
21	4 44 18.42	− 2.000	+22 35 29.4	−43.96	0 47.8	21	4 28 12.96	+ 7.612	+18 1 52.8	+36.13	22 29.0
22	4 43 22.02	2.691	22 17 20.6	46.71	0 43.0	22	4 31 24.48	8.348	18 16 53.1	38.84	22 28.5
23	4 42 9.72	3.323	21 58 9.9	49.12	0 37.8	23	4 34 53.64	9.082	18 32 54.6	41.23	22 28.3
24	4 40 43.08	3.885	21 38 6.3	51.12	0 32.4	24	4 38 40.37	9.812	18 49 49.6	43.29	22 28.4
25	4 39 3.85	4.371	21 17 19.8	52.68	0 26.9	25	4 42 44.62	10.542	19 7 30.0	45.02	22 28.8
26	4 37 13.95	− 4.773	+20 56 1.4	−53.76	0 21.1	26	4 47 6.36	+11.270	+19 25 47.6	+46.40	22 29.5
27	4 35 15.47	5.085	20 34 23.4	54.32	0 15.2	27	4 51 45.57	11.998	19 44 33.9	47.40	22 30.5
28	4 33 10.60	5.304	20 12 38.3	54.33	0 9.2	28	4 56 42.24	12.725	20 3 39.7	48.02	22 31.8
29	4 31 1.65	5.425	19 51 0.0	53.77	0 3.2 23 57.1	29	5 1 56.36	13.452	20 22 55.9	48.26	22 33.4
30	4 28 50.97	5.448	19 29 42.0	52.63	23 51.0	30	5 7 27.93	14.178	20 42 13.0	48.09	22 35.2
31	4 26 40.89	− 5.375	+19 8 58.6	−50.89	23 45.0	31	5 13 16.91	+14.903	+21 1 20.8	+47.49	22 37.3
32	4 24 33.70	− 5.209	+18 49 3.8	−48.59	23 39.0	32	5 19 23.25	+15.624	+21 20 9.0	+46.45	22 39.8

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	3″.5	4″.0	4″.8	5″.1	5″.6	6″.0	6″.1
Hor. Parallax . .	9.2	10.5	11.9	13.5	14.9	15.8	16.1

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter . .	5″.9	5″.4	4″.9	4″.4	3″.9	3″.4
Hor. Parallax . .	15.6	14.4	13.0	11.6	10.3	9.1

NOTE.—The sign + indicates north declinations: the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	5 13 16.91	+14.903	+21 1 20.8	+47.49	22 37.3
2	5 19 23.25	15.624	21 20 9.0	46.45	22 39.8
3	5 25 46.86	16.340	21 38 26.9	44.95	22 42.5
4	3 32 27.56	17.049	21 56 3.0	42.97	22 45.5
5	5 39 25.15	17.746	22 12 45.8	40.51	22 48.8
6	5 46 39.26	+18.427	+22 28 23.4	+37.54	22 52.4
7	5 54 9.46	19.086	22 42 43.7	34.06	22 56.2
8	6 1 55.16	19.717	22 55 34.5	30.08	23 0.2
9	6 9 55.61	20.314	23 6 44.0	25.60	23 4.6
10	6 18 9.89	20.868	23 16 0.0	20.65	23 9.1
11	6 26 36.91	+21.374	+23 23 11.7	+15.25	23 13.8
12	6 35 15.42	21.824	23 28 8.7	9.44	23 18.7
13	6 44 3.97	22.211	23 30 42.0	+ 3.28	23 23.7
14	6 53 0.99	22.528	23 30 43.8	− 3.17	23 28.8
15	7 2 4.77	22.773	23 28 8.1	9.83	23 34.0
16	7 11 13.54	+22.944	+23 22 50.7	−16.63	23 39.3
17	7 20 25.50	23.040	23 14 49.4	23.48	23 44.6
18	7 29 38.85	23.060	23 4 4.1	30.29	23 49.9
19	7 38 51.83	23.009	22 50 36.3	37.00	23 55.2
20	7 48 2.80	22.893	22 34 29.4	43.53	
21	7 57 10.23	+22.716	+22 15 48.5	−49.82	0 0.4
22	8 6 12.76	22.486	21 54 40.1	55.82	0 5.5
23	8 15 9.19	22.210	21 31 11.6	61.50	0 10.5
24	8 23 58.51	21.895	21 5 31.0	66.82	0 15.4
25	8 32 39.88	21.548	20 37 47.2	71.77	0 20.2
26	8 41 12.62	+21.177	+20 8 9.3	−76.34	0 24.8
27	8 49 36.22	20.788	19 36 46.0	80.53	0 29.2
28	8 57 50.33	20.386	19 3 46.8	84.35	0 33.5
29	9 5 54.70	19.977	18 29 20.3	87.80	0 37.6
30	9 13 49.19	19.564	17 53 35.0	90.91	0 41.6
31	9 21 33.78	+19.152	+17 16 39.1	−93.69	0 45.4
32	9 29 8.48	+18.742	+16 38 40.2	−96.16	0 49.1

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter . .	3″.1	2″.8	2″.6	2″.5	2″.5	2″.5
Hor. Parallax . .	8.2	7.5	7.0	6.7	6.6	6.6

AUGUST.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	9 29 8.48	+18.742	+16 38 40.2	− 96.16	0 49.1
2	9 36 33.41	18.337	15 59 45.7	98.33	0 52.6
3	9 43 48.70	17.939	15 20 2.4	100.23	0 55.9
4	9 50 54.54	17.549	14 39 36.6	101.87	0 59.0
5	9 57 51.14	17.169	13 58 34.3	103.27	1 2.0
6	10 4 38.72	+16.798	+13 17 1.3	−104.44	1 4.9
7	10 11 17.53	16.438	12 35 2.6	105.41	1 7.6
8	10 17 47.81	16.087	11 52 43.0	106.19	1 10.1
9	10 24 9.80	15.746	11 10 7.0	106.78	1 12.5
10	10 30 23.72	15.415	10 27 19.0	107.20	1 14.8
11	10 36 29.82	+15.094	+ 9 44 22.7	−107.46	1 17.0
12	10 42 28.34	14.782	9 1 22.0	107.57	1 19.0
13	10 48 19.44	14.478	8 18 20.7	107.53	1 20.9
14	10 54 3.33	14.182	7 35 21.7	107.36	1 22.7
15	10 59 40.21	13.892	6 52 28.3	107.06	1 24.4
16	11 5 10.21	+13 609	+ 6 9 43.7	−106.63	1 26.0
17	11 10 33.48	13.331	5 27 10.8	106.09	1 27.4
18	11 15 50.13	13.057	4 44 52.3	105.42	1 28.7
19	11 21 0.25	12.787	4 2 51.3	104.64	1 29.9
20	11 26 3.91	12.519	3 21 10.5	103.74	1 31.0
21	11 31 1.17	+12.253	+ 2 39 52.5	−102.74	1 32.0
22	11 35 52.05	11.987	1 59 0.1	101.61	1 32.9
23	11 40 36.55	11.721	1 18 36.0	100.37	1 33.7
24	11 45 14.62	11.452	+ 0 38 43.1	99.02	1 34.4
25	11 49 46.21	11.180	− 0 0 35.8	97.54	1 35.0
26	11 54 11.22	+10.903	− 0 39 17.7	− 95.94	1 35.5
27	11 58 29.51	10.620	1 17 19.7	94.21	1 35.8
28	12 2 40.92	10.330	1 54 38.5	92.34	1 36.1
29	12 6 45.26	10.030	2 31 10.7	90.32	1 36.2
30	12 10 42.27	9.718	3 6 52.9	88.16	1 36.2
31	12 14 31.64	+ 9.393	− 3 41 41.2	− 85.84	1 36.1
32	12 18 13.03	+ 9.053	− 4 15 31.6	− 83.34	1 35.8

Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
Semidiameter . .	2″.6	2″.6	2″.7	2″.9	3″.1	3″.3
Hor. Parallax . .	6.8	7.0	7.3	7.7	8.1	8.7

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	12 18 13.03	+9.053	−4 15 31.6	− 83.34	1 35.8
2	12 21 46.07	8.696	4 48 19.8	80.65	1 35.4
3	12 25 10.29	8.319	5 20 1.0	77.75	1 34.9
4	12 28 25.19	7.919	5 50 30.2	74.63	1 34.2
5	12 31 30.17	7.493	6 19 41.8	71.28	1 33.3
6	12 34 24.61	+7.038	−6 47 29.7	− 67.66	1 32.2
7	12 37 7.77	6.552	7 13 47.1	63.75	1 31.0
8	12 39 38.86	6.032	7 38 26.8	59.52	1 29.6
9	12 41 57.03	5.475	8 1 21.0	54.94	1 27.9
10	12 44 1.32	4.876	8 22 20.7	49.98	1 26.0
11	12 45 50.73	+4.233	−8 41 16.4	− 44.60	1 23.9
12	12 47 24.15	3.544	8 57 57.8	38.76	1 21.5
13	12 48 40.47	2.806	9 12 13.2	32.44	1 18.8
14	12 49 38.46	2.018	9 23 50.8	25.60	1 15.8
15	12 50 16.96	1.180	9 32 37.5	18.19	1 12.5
16	12 50 34.75	+0.294	−9 38 19.3	− 10.20	1 8.8
17	12 50 30.72	−0.637	9 40 42.1	− 1.60	1 4.8
18	12 50 3.83	1.608	9 39 31.5	+ 7.58	1 0.4
19	12 49 13.28	2.609	9 34 33.7	17.33	0 55.7
20	12 47 58.48	3.626	9 25 35.6	27.59	0 50.5
21	12 46 19.26	−4.641	−9 12 26.1	+ 38.25	0 44.9
22	12 44 15.90	5.633	8 54 57.7	49.15	0 38.9
23	12 41 49.29	6.574	8 33 6.5	60.10	0 32.5
24	12 39 1.02	7.433	8 6 54.8	70.81	0 25.8
25	12 35 53.44	8.176	7 36 32.2	80.95	0 18.8
26	12 32 29.79	−8.767	−7 2 16.9	+ 90.13	0 11.5
27	12 28 54.11	9.172	6 24 36.7	97.96	0 4.0 23 56.4
28	12 25 11.27	9.360	5 44 8.9	104.03	23 48.7
29	12 21 26.76	9.307	5 1 40.1	107.98	23 41.1
30	12 17 46.54	9.001	4 18 5.0	109.53	23 33.7
31	12 14 16.74	−8.440	−3 34 23.2	+108.51	23 26.6
32	12 11 3.43	−7.630	−2 51 37.3	+104.88	23 19.8

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
Semidiameter . .	3″.5	3″.8	4″.2	4″.6	5″.0	5″.1
Hor. Parallax . .	9.3	10.1	11.1	12.2	13.2	13.5

OCTOBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	12 14 16.74	− 8.440	−3 34 23.2	+108.51	23 26.6
2	12 11 3.43	7.630	2 51 37.3	104.88	23 19.8
3	12 8 12.25	6.599	2 10 48.4	98.78	23 13.5
4	12 5 48.20	5.375	1 32 53.7	90.42	23 7.7
5	12 3 55.47	3.998	0 58 43.8	80.12	23 2.4
6	12 2 37.18	− 2.512	−0 29 0.2	+ 68.30	22 57.8
7	12 1 55.43	− 0.960	−0 4 14.5	55.36	22 53.7
8	12 1 51.29	+ 0.615	+0 15 11.6	41.74	22 50.3
9	12 2 24.82	2.174	0 29 6.6	27.83	22 47.6
10	12 3 35.27	3.685	0 37 28.0	13.98	22 45.4
11	12 5 21.13	+ 5.122	+0 40 20.6	+ 0.49	22 43.7
12	12 7 40.37	6.464	0 37 56.0	− 12.42	22 42.6
13	12 10 30.54	7.698	0 30 30.5	24.56	22 41.9
14	12 13 48.95	8.816	0 18 24.2	35.81	22 41.7
15	12 17 32.78	9.817	+0 1 59.5	46.08	22 41.8
16	12 21 39.22	+10.701	−0 18 19.5	− 55.34	22 42.3
17	12 26 5.53	11.473	0 42 8.5	63.58	22 43.1
18	12 30 49.11	12.141	1 9 3.4	70.83	22 44.1
19	12 35 47.55	12.715	1 38 40.8	77.13	22 45.3
20	12 40 58.67	13.201	2 10 38.3	82.52	22 46.7
21	12 46 20.53	+13.610	−2 44 35.4	− 87.09	22 48.3
22	12 51 51.42	13.953	3 20 12.7	90.89	22 50.0
23	12 57 29.82	14.238	3 57 12.6	93.99	22 51.8
24	13 3 14.45	14.474	4 35 19.3	96.47	22 53.7
25	13 9 4.23	14.668	5 14 18.5	98.38	22 55.7
26	13 14 58.24	+14.828	−5 53 57.6	− 99.80	22 57.7
27	13 20 55.72	14.959	6 34 5.2	100.77	22 59.7
28	13 26 56.05	15.066	7 14 31.3	101.34	23 1.8
29	13 32 58.73	15.154	7 55 6.9	101 58	23 3.9
30	13 39 3.34	15.228	8 35 44.5	101.51	23 6.1
31	13 45 9.56	+15.289	−9 16 17.0	−101.16	23 8.3
32	13 51 17.15	+15.342	−9 56 38.4	−100.58	23 10.5

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
Semidiameter . .	4″.8	4″.2	3″.6	3″.2	2″.8	2″.6
Hor. Parallax . .	12.8	11.2	9.6	8.4	7.5	6.9

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.						DECEMBER.					
Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.	Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	13 51 17.15	+15.342	− 9 56 38.4	−100.58	23 10.5	1	17 3 49.33	+16.912	−24 30 56.9	−33.91	0 22.7
2	13 57 25.93	15.388	10 36 43.4	99.79	23 12.7	2	17 10 35.83	16.962	24 43 51.9	30.67	0 25.5
3	14 3 35.75	15.430	11 16 26.9	98.81	23 15.0	3	17 17 23.48	17.008	24 55 28.5	27.37	0 28.4
4	14 9 46.53	15.468	11 55 44.7	97.66	23 17.2	4	17 24 12.14	17.047	25 5 45.2	24.02	0 31.3
5	14 15 58.20	15.504	12 34 33.3	96.37	23 19.5	5	17 31 1.66	17.079	25 14 40.7	20.60	0 34.2
6	14 22 10.73	+15.540	−13 12 49.3	−94.94	23 21.8	6	17 37 51.86	+17.103	−25 22 13.5	−17.13	0 37.1
7	14 28 24.12	15.576	13 50 29.6	93.40	23 24.1	7	17 44 42.51	17.117	25 28 22.6	13.62	0 40.0
8	14 34 38.39	15.613	14 27 31.4	91.74	23 26.4	8	17 51 33.37	17.120	25 33 6.6	10.05	0 42.9
9	14 40 53.57	15.652	15 3 52.3	89.98	23 28.7	9	17 58 24.18	17.112	25 36 24.4	6.42	0 45.8
10	14 47 9.68	15.691	15 39 29.9	88.13	23 31.1	10	18 5 14.61	17.089	25 38 14.7	− 2.76	0 48.7
11	14 53 26.77	+15.733	−16 14 22.2	−86.20	23 33.4	11	18 12 4.31	+17.050	−25 38 36.6	+ 0.94	0 51.6
12	14 59 44.89	15.778	16 48 27.1	84.19	23 35.8	12	18 18 52.86	16.993	25 37 29.6	4.66	0 54.4
13	15 6 4.11	15.825	17 21 42.9	82.11	23 38.2	13	18 25 39.81	16.916	25 34 52.7	8.42	0 57.3
14	15 12 24.49	15.874	17 54 7.7	79.95	23 40.6	14	18 32 24.63	16.816	25 30 45.5	12.18	1 0.1
15	15 18 46.07	15.925	18 25 39.9	77.72	23 43.1	15	18 39 6.75	16.690	25 25 7.8	15.95	1 2.8
16	15 25 8.92	+15.979	−18 56 17.9	−75.43	23 45.6	16	18 45 45.51	+16.535	−25 17 59.7	+19.71	1 5.5
17	15 31 33.10	16.036	19 26 0.3	73.08	23 48.1	17	18 52 20.18	16.349	25 9 21.6	23.45	1 8.2
18	15 37 58.65	16.094	19 54 45.4	70.67	23 50.6	18	18 58 49.90	16.123	24 59 14.3	27.15	1 10.8
19	15 44 25.65	16.155	20 22 31.9	68.19	23 53.1	19	19 5 13.73	15.856	24 47 39.1	30.78	1 13.2
20	15 50 54.11	16.218	20 49 18.2	65.65	23 55.6	20	19 11 30.61	15.542	24 34 37.9	34.31	1 15.5
21	15 57 24.09	+16.281	−21 15 2.9	−63.06	23 58.2	21	19 17 39.33	+15.175	−24 20 13.2	+37.72	1 17.7
22	16 3 55.60	16.345	21 39 44.7	60.41		22	19 23 38.51	14.746	24 4 28.3	40.98	1 19.8
23	16 10 28.68	16.412	22 3 22.2	57.70	0 0.8	23	19 29 26.60	14.249	23 47 27.4	44.05	1 21.6
24	16 17 3.35	16.478	22 25 53.9	54.93	0 3.5	24	19 35 1.87	13.676	23 29 15.8	46.87	1 23.3
25	16 23 39.60	16.544	22 47 18.5	52.11	0 6.2	25	19 40 22.38	13.018	23 9 59.8	49.40	1 24.7
26	16 30 17.44	+16.610	−23 7 34.5	−49.22	0 8 9	26	19 45 25.95	+12.263	−22 49 47.2	+51.58	1 25.8
27	16 36 56.85	16.675	23 26 40.5	46.28	0 11.6	27	19 50 10.13	11.400	22 28 47.2	53.35	1 26.5
28	16 43 37.79	16.738	23 44 35.2	43.27	0 14.3	28	19 54 32.22	10.420	22 7 10.3	54.64	1 26.9
29	16 50 20.23	16.798	24 1 17.1	40.21	0 17.1	29	19 58 29.29	9.314	21 45 9.0	55.37	1 26.9
30	16 57 4.10	16.857	24 16 44.8	37.09	0 19.9	30	20 1 58.20	8.071	21 22 57.4	55.48	1 26.4
31	17 3 49.33	+16.912	−24 30 56.9	−33.91	0 22 7	31	20 4 55.55	+ 6.684	−21 0 51.1	+54.90	1 25.4
32	17 10 35.83	+16.962	−24 43 51.9	−30.67	0 25.5	32	20 7 17.87	+ 5.151	−20 39 7.7	+53.58	1 23.8

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter . . .	2″.5	2″.4	2″.3	2″.3	2″.3	2″.3
Hor. Parallax . . .	6.6	6.3	6.2	6.1	6.1	6.2

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	32d.
Semidiameter . .	2″.4	2″.5	2″.6	2″.7	3″.0	3″.3	3″.8
Hor. Parallax . .	6.3	6.5	6.8	7.2	7.8	8.7	10.0

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	17 58 8.10	+13.695	−23 24 21.8	− 6.78	23 15.3
2	18 3 36.68	13.703	23 26 42.8	4.97	23 16.9
3	18 9 5.82	13.708	23 28 20.4	3.16	23 18.4
4	18 14 34.86	13.711	23 29 14.5	− 1.35	23 20.0
5	18 20 3.93	13.712	23 29 24.9	+ 0.47	23 21.5
6	18 25 32.99	+13.710	−23 28 51.8	+ 2.28	23 23.0
7	18 31 1.97	13.705	23 27 35.1	4.10	23 24.5
8	18 36 30.81	13.698	23 25 34.8	5.92	23 26.1
9	18 41 59.44	13.688	23 22 51.0	7.73	23 27.6
10	18 47 27.82	13.676	23 19 23.7	9.54	23 28.1
11	18 52 55.88	+13.662	−23 15 13.1	+11.34	23 30.6
12	18 58 23.56	13.645	23 10 19.4	13.13	23 32.1
13	19 3 50.80	13.626	23 4 42.7	14.92	23 33.6
14	19 9 17.55	13.604	22 58 23.3	16.70	23 35.1
15	19 14 43.75	13.580	22 51 21.5	18.46	23 36.6
16	19 20 9.35	+13.554	−22 43 37.5	+20.21	23 38.1
17	19 25 34.29	13.525	22 35 11.7	21.94	23 39.6
18	19 30 58.51	13.494	22 26 4.4	23.66	23 41.1
19	19 36 21.97	13.461	22 16 16.0	25.37	23 42.5
20	19 41 44.62	13.426	22 5 47.0	27.05	23 43.9
21	19 47 6.40	+13.389	−21 54 37.8	+28.72	23 45.3
22	19 52 27.28	13.351	21 42 48.8	30.37	23 46.7
23	19 57 47.23	13.311	21 30 20.4	32.00	23 48.1
24	20 3 6.18	13.269	21 17 13.2	33.61	23 49.5
25	20 8 24.10	13.225	21 3 27.7	35.19	23 50.8
26	20 13 40.97	+13.181	−20 49 4.4	+36.75	23 52.1
27	20 18 56.76	13.135	20 34 4.1	38.28	23 53.4
28	20 24 11.42	13.088	20 18 27.4	39.78	23 54.7
29	20 29 24.95	13.040	20 2 14.8	41.26	23 55.9
30	20 34 37.31	12.991	19 45 26.9	42.72	23 57.2
31	20 39 48.50	+12.941	−19 28 4.4	+44.15	23 58.4
32	20 44 58.49	+12.891	−19 10 8.0	+45.55	23 59.6

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	5″.1	5″.1	5″.1	5″.1	5″.0	5″.0	5″.0
Hor. Parallax . .	5.3	5.3	5.3	5.2	5.2	5.2	5.2

FEBRUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	20 44 58.49	+12.891	−19 10 8.0	+45.55	23 59.6
2	20 50 7.27	12.841	18 51 38.3	46.92	
3	20 55 14.84	12.790	18 32 36.1	48.27	0 0.8
4	21 0 21.19	12.739	18 13 2.0	49.58	0 2.0
5	21 5 26.31	12.688	17 52 56.6	50.87	0 3.1
6	21 10 30.20	+12.637	−17 32 20.7	+52.12	0 4.2
7	21 15 32.87	12.586	17 11 15.1	53.35	0 5.3
8	21 20 34.31	12.535	16 49 40.4	54.54	0 6.4
9	21 25 34.54	12.484	16 27 37.4	55.71	0 7.5
10	21 30 33.55	12.434	16 5 6.8	56.84	0 8.5
11	21 35 31.37	+12.384	−15 42 9.4	+57.95	0 9.5
12	21 40 28.00	12.335	15 18 45.8	59.02	0 10.5
13	21 45 23.45	12.286	14 54 56.9	60.06	0 11.4
14	21 50 17.73	12.237	14 30 43.4	61.07	0 12.4
15	21 55 10.85	12.190	14 6 6.1	62.05	0 13.3
16	22 0 2.84	+12.143	−13 41 5.7	+62.99	0 14.3
17	22 4 53.71	12.097	13 15 43.1	63.90	0 15.2
18	22 9 43.49	12.052	12 49 59.0	64.78	0 16.1
19	22 14 32.19	12.008	12 23 54.1	65.63	0 17.0
20	22 19 19.84	11.964	11 57 29.3	66.44	0 17.9
21	22 24 6.45	+11.921	−11 30 45.3	+67.22	0 18.7
22	22 28 52.06	11.880	11 3 42.9	67.97	0 19.5
23	22 33 36.68	11.840	10 36 22.9	68.69	0 20.3
24	22 38 20.36	11.801	10 8 46.0	69.38	0 21.1
25	22 43 3.13	11.763	9 40 53.1	70.03	0 21.9
26	22 47 45.00	+11.727	− 9 12 44.9	+70.65	0 22.7
27	22 52 26.02	11.692	8 44 22.2	71.24	0 23.4
28	22 57 6.21	11.658	8 15 45.7	71.80	0 24.1
29	23 1 45.61	11.626	7 46 56.2	72.33	0 24.8
30	23 6 24.27	11.596	7 17 54.5	72.82	0 25.5
31	23 11 2.22	+11.567	− 6 48 41.3	+73.28	0 26.2
32	23 15 39.50	+11.540	− 6 19 17.3	+73.71	0 26.9

Day of the Month.	5th.	10th.	15th.	20th.	25th.
Semidiameter.	5″.0	5″.0	5″.0	5″.0	5″.0
Hor. Parallax	5.2	5.2	5.2	5.2	5.2

NOTE.—The sign + indicates north declinations: the sign — indicates south declinations.

GREENWICH MEAN TIME.

Day of Month.	MARCH. Apparent Right Ascension.						Day of Month.	APRIL. Apparent Right Ascension.				
	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.			Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*				*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m			h m s	s	° ′ ″	″	h m
1	23 1 45.61	+11.626	−7 46 56.2	+72.33	0 24.8		1	1 23 20.48	+11.485	+7 46 58.9	+73.40	0 44.2
2	23 6 24.27	11.596	7 17 54.5	72.82	0 25.5		2	1 27 56.39	11.508	8 16 15.1	72.94	0 44.9
3	23 11 2.22	11.567	6 48 41.3	73.28	0 26.2		3	1 32 32.86	11.532	8 45 19.9	72.45	0 45.5
4	23 15 39.50	11.540	6 19 17.3	73.71	0 26.9		4	1 37 9.93	11.558	9 14 12.6	71.93	0 46.2
5	23 20 16.18	11.515	5 49 43.3	74.11	0 27.5		5	1 41 47.64	11.585	9 42 52.5	71.38	0 46.9
6	23 24 52.21	+11.491	−5 20 0.1	+74.48	0 28.2		6	1 46 26.02	+11.614	+10 11 18.9	+70.81	0 47.6
7	23 29 27.72	11.469	4 50 8.3	74.82	0 28.8		7	1 51 5.12	11.644	10 39 31.0	70.20	0 48.3
8	23 34 2.73	11.449	4 20 8.7	75.13	0 29.5		8	1 55 44.96	11.676	11 7 28.2	69.56	0 49.0
9	23 38 37.27	11.431	3 50 2.1	75.41	0 30.1		9	2 0 25.58	11.709	11 35 9.6	68.89	0 49.7
10	23 43 11.39	11.414	3 19 49.1	75.66	0 30.8		10	2 5 7.02	11.744	12 2 34.6	68.19	0 50.5
11	23 47 45.14	+11.399	−2 49 30.5	+75.88	0 31.4		11	2 9 45.30	+11.780	+12 29 42.4	+67.45	0 51.2
12	23 52 18.55	11.386	2 19 7.0	76.07	0 32.0		12	2 14 32.46	11.817	12 56 32.2	66.69	0 52.0
13	23 56 51.67	11.375	1 48 39.4	76.23	0 32.6		13	2 19 16.53	11.855	13 23 3.4	65.89	0 52.8
14	0 1 24.53	11.365	1 18 8.3	76.36	0 33.2		14	2 24 1.52	11.895	13 49 15.1	65.07	0 53.6
15	0 5 57.19	11.357	0 47 34.5	76.46	0 33.8		15	2 28 47.47	11.935	14 15 6.6	64.21	0 54.4
16	0 10 29.68	+11.351	−0 16 58.7	+76.53	0 34.4		16	2 33 34.39	+11.976	+14 40 37.1	+63.33	0 55.3
17	0 15 2.05	11.347	+0 13 38.3	76.57	0 35.0		17	2 38 22.31	12.018	15 5 46.0	62.41	0 56.1
18	0 19 34.34	11.344	0 44 15.9	76.57	0 35.6		18	2 43 11.25	12.061	15 30 32.4	61.46	0 57.0
19	0 24 6.59	11.343	1 14 53.3	76.54	0 36.2		19	2 48 1.23	12.104	15 54 55.6	60.47	0 57.9
20	0 28 38.84	11.344	1 45 29.6	76.49	0 36.8		20	2 52 52.26	12.148	16 18 54.8	59.46	0 58.8
21	0 33 11.14	+11.347	+2 16 4.2	+76.40	0 37.4		21	2 57 44.35	+12.193	+16 42 29.3	+58.41	0 59.7
22	0 37 43.50	11.351	2 46 36.4	76.28	0 38.0		22	3 2 37.52	12.238	17 5 38.4	57.33	1 0.7
23	0 42 15.98	11.357	3 17 5.3	76.13	0 38.6		23	3 7 31.77	12.283	17 28 21.2	56.22	1 1.6
24	0 46 48.63	11.365	3 47 30.3	75.95	0 39.2		24	3 12 27.11	12.328	17 50 36.8	55.08	1 2.6
25	0 51 21.48	11.374	4 17 50.6	75.73	0 39.8		25	3 17 23.54	12.376	18 12 24.9	53.91	1 3.6
26	0 55 54.58	+11.385	+4 48 5.4	+75.49	0 40.4		26	3 22 21.06	+12.419	+18 33 44.5	+52.71	1 4.6
27	1 0 27.96	11.398	5 18 14.0	75.22	0 41.0		27	3 27 19.67	12.465	18 54 34.9	51.48	1 5.6
28	1 5 1.66	11.412	5 48 15.7	74.92	0 41.6		28	3 32 19.39	12.510	19 14 55.5	50.22	1 6.7
29	1 9 35.72	11.428	6 18 9.8	74.59	0 42.3		29	3 37 20.20	12.556	19 34 45.4	48.93	1 7.8
30	1 14 10.18	11.445	6 47 55.5	74.22	0 42.9		30	3 42 22.10	12.601	19 54 4.1	47.61	1 8.9
31	1 18 45.09	+11.464	+7 17 32.1	+73.83	0 43.6		31	3 47 25.07	+12.646	+20 12 50.8	+46.27	1 10.0
32	1 23 20.48	+11.485	+7 46 58.9	+73.40	0 44.2		32	3 52 29.12	+12.690	+20 31 4.9	+44.90	1 11.1

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.
Semidiameter . .	5″.0	5″.0	5″.0	5″.0	5″.0	5″.0	Semidiameter . .	5″.1	5″.1	5″.1	5″.2	5″.2	5″.3
Hor. Parallax . .	5.2	5.2	5.2	5.2	5.2	5.2	Hor. Parallax . .	5.3	5.3	5.3	5.4	5.4	5.5

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The — sign indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	3 47 25.07	+12.646	+20 12 50.8	+46.27	1 10.0	1	6 30 19.61	+13.308	+24 41 46.2	− 5.24	1 50.8
2	3 52 29.12	12 690	20 31 4.9	44.90	1 11.1	2	6 35 38.83	13.292	24 39 19.0	7.03	1 52.2
3	3 57 34.22	12.734	20 48 45.7	43.50	1 12.2	3	6 40 57.63	13.274	24 36 8.8	8.82	1 53.5
4	4 2 40.37	12.777	21 5 52.7	42.07	1 13.4	4	6 46 15.95	13.253	24 32 15.8	10.60	1 54.9
5	4 7 47.55	12.820	21 22 25.1	40.62	1 14.6	5	6 51 33.75	13.230	24 27 40.3	12.37	1 56.2
6	4 12 55.74	+12.862	+21 38 22.1	+39.14	1 15.8	6	6 56 50.96	+13.205	+24 22 22.4	−14.12	1 57.6
7	4 18 4.92	12.903	21 53 43.9	37.64	1 17.0	7	7 2 7.53	13.177	24 16 22.4	15.87	1 58.9
8	4 23 15.06	12.942	22 8 29.0	36.12	1 18.2	8	7 7 23.40	13.146	24 9 40.5	17.61	2 0.2
9	4 28 26.14	12.981	22 22 37.2	34.57	1 19.4	9	7 12 38.51	13.113	24 2 17.1	19.34	2 1.5
10	4 33 38.13	13.018	22 36 8.0	33.00	1 20.7	10	7 17 52.82	13.078	23 54 12.4	21.05	2 2.8
11	4 38 51.01	+13.054	+22 49 0.8	+31.41	1 22.0	11	7 23 6.28	+13.042	+23 45 26.9	−22.74	2 4.1
12	4 44 4.73	13.088	23 1 15.2	29.80	1 23.3	12	7 28 18.84	13.004	23 36 1.0	24.42	2 5.4
13	4 49 19.25	13.121	23 12 50.6	28 16	1 24.6	13	7 33 30.45	12.964	23 25 55.1	26.08	2 6.6
14	4 54 34.53	13.152	23 23 46.6	26.50	1 25.9	14	7 38 41.05	12.921	23 15 9.6	27.72	2 7.8
15	4 59 50.53	13.181	23 34 2.7	24.83	1 27.2	15	7 43 50.61	12.876	23 3 44.9	29.34	2 9.0
16	5 5 7.21	+13.208	+23 43 38.5	+23.14	1 28.6	16	7 48 59.09	+12.830	+22 51 41.4	−30.94	2 10.2
17	5 10 24.52	13.233	23 52 33.5	21.43	1 29.9	17	7 54 6.44	12.782	22 38 59.7	32.52	2 11.4
18	5 15 42.41	13.255	24 0 47.4	19.71	1 31.3	18	7 59 12.62	12.732	22 25 40.3	34.08	2 12.6
19	5 21 0.80	13.276	24 8 19.9	17.98	1 32.6	19	8 4 17.59	12.681	22 11 43.8	35.62	2 13.7
20	5 26 19.66	13.294	24 15 10.6	16.24	1 34.0	20	8 9 21.33	12.629	21 57 10.7	37.13	2 14.8
21	5 31 38.92	+13.310	+24 21 19.2	+14.48	1 35.4	21	8 14 23.79	+12.576	+21 42 1.6	−38.62	2 15.9
22	5 36 58.52	13.323	24 26 45.5	12.71	1 36.8	22	8 19 24.95	12.521	21 26 17.2	40.08	2 17.0
23	5 42 18.41	13.334	24 31 29.3	10.93	1 38.2	23	8 24 24.78	12.465	21 9 57.9	41.52	2 18.1
24	5 47 38.52	13.342	24 35 30.3	9.15	1 39.6	24	8 29 23.25	12.408	20 53 4.4	42.93	2 19.2
25	5 52 58.78	13.347	24 38 48.4	7.36	1 41.0	25	8 34 20.35	12.350	20 35 37.4	44.32	2 20.2
26	5 58 19.13	+13.350	+24 41 23.4	+ 5.56	1 42.4	26	8 39 16.06	+12.292	+20 17 37.5	−45.67	2 21.2
27	6 3 39.52	13.349	24 43 15.3	3.76	1 43.8	27	8 44 10.35	12.233	19 59 5.5	46.99	2 22.2
28	6 8 59.87	13.346	24 44 24.0	1.96	1 45.2	28	8 49 3.22	12.173	19 40 2.1	48.29	2 23.1
29	6 14 20.12	13.341	24 44 49.4	+ 0.16	1 46.6	29	8 53 54.64	12 113	19 20 27.8	49.56	2 24.0
30	6 19 40.20	13.333	24 44 31.6	− 1.64	1 48.0	30	8 58 44.62	12.052	19 0 23.4	50.80	2 24.9
31	6 25 0.05	+13.322	+24 43 30.4	− 3.44	1 49.4	31	9 3 33.16	+11.992	+18 39 49.5	−52.01	2 25.7
32	6 30 19.61	+13.308	+24 41 46.2	− 5.24	1 50.8	32	9 8 20.26	+11.932	+18 18 46.8	−53.20	2 26.5

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	5″.3	5″.4	5″.4	5″.5	5″.6	5″.7	5″.8
Hor. Parallax . .	5.5	5.6	5.6	5.7	5.8	5.9	6.0

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter . .	5″.9	6″.0	6″.1	6″.2	6″.4	6″.5
Hor. Parallax . .	6.1	6.2	6.3	6.4	6.6	6.8

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	9 3 33.16	+11.992	+18 39 49.5	−52.01	2 25.7	1	11 21 43.49	+10.430	+ 5 2 44.4	−75.07	2 41.6
2	9 8 20.26	11.932	18 18 46.8	53.20	2 26.5	2	11 25 53.39	10.396	4 32 39.4	75.35	2 41.8
3	9 13 5.91	11.872	17 57 16.0	54.35	2 27.3	3	11 30 2.50	10.364	4 2 28.0	75.61	2 42.0
4	9 17 50.12	11.812	17 35 17.9	55.48	2 28.1	4	11 34 10.84	10.333	3 32 10.7	75.84	2 42.2
5	9 22 32.90	11.752	17 12 53.1	56.58	2 28.9	5	11 38 18.46	10.303	3 1 48.2	76.04	2 42.4
6	9 27 14.25	+11.693	+16 50 2.3	−57.65	2 29.7	6	11 42 25.38	+10.275	+ 2 31 21.2	−76.21	2 42.6
7	9 31 54.18	11.634	16 26 46.3	58.68	2 30.4	7	11 46 31.65	10.248	2 0 50.2	76.36	2 42.8
8	9 36 32.71	11.576	16 3 5.6	59.69	2 31.1	8	11 50 37.29	10.222	1 30 15.9	76.49	2 42.9
9	9 41 9.85	11.519	15 39 1.2	60.67	2 31.8	9	11 54 42.34	10.198	0 59 39.0	76.59	2 43.0
10	9 45 45.62	11.462	15 14 33.7	61.62	2 32.4	10	11 58 46.83	10.175	+ 0 28 59.9	76.67	2 43.1
11	9 50 20.02	+11.406	+14 49 43.8	−62.54	2 33.0	11	12 2 50.79	+10.154	− 0 1 40.8	−76.72	2 43.2
12	9 54 53.08	11.350	14 24 32.0	63.43	2 33.6	12	12 6 54.26	10.134	0 32 22.3	76.74	2 43.3
13	9 59 24.81	11.295	13 58 59.2	64.30	2 34.2	13	12 10 57.25	10.115	1 3 4.0	76.74	2 43.4
14	10 3 55.23	11.241	13 33 6.1	65.13	2 34.8	14	12 14 59.80	10.097	1 33 45.4	76.71	2 43.5
15	10 8 24.36	11.188	13 6 53.3	65.93	2 35.3	15	12 19 1.92	10.080	2 4 25.7	76.65	2 43.6
16	10 12 52.22	+11.135	+12 40 21.6	−66.70	2 35.8	16	12 23 3.65	+10.064	− 2 35 4.3	−76.57	2 43.7
17	10 17 18.83	11.083	12 13 31.8	67.45	2 36.3	17	12 27 5.01	10.049	3 5 40.7	76.46	2 43.8
18	10 21 44.21	11.032	11 46 24.5	68.16	2 36.8	18	12 31 6.04	10.035	3 36 14.1	76.32	2 43.9
19	10 26 8.38	10.982	11 19 0.5	68.84	2 37.3	19	12 35 6.73	10.022	4 6 44.0	76.16	2 44.0
20	10 30 31.36	10.933	10 51 20.4	69.49	2 37.8	20	12 39 7.12	10.010	4 37 9.6	75.97	2 44.0
21	10 34 53.18	+10.885	+10 23 25.0	−70.11	2 38.2	21	12 43 7.23	+ 9.999	− 5 7 30.3	−75.75	2 44.1
22	10 39 13.85	10.838	9 55 15.0	70.71	2 38.6	22	12 47 7.07	9.988	5 37 45.6	75.51	2 44.1
23	10 43 33.40	10.792	9 26 51.0	71.28	2 39.0	23	12 51 6.65	9.978	6 7 54.7	75.24	2 44.2
24	10 47 51.86	10.747	8 58 13.8	71.82	2 39.4	24	12 55 6.01	9.969	6 37 57.1	74.94	2 44.2
25	10 52 9.25	10.703	8 29 24.1	72.33	2 39.7	25	12 59 5.15	9.960	7 7 52.0	74.62	2 44.3
26	10 56 25.61	+10.660	+ 8 0 22.7	−72.80	2 40.0	26	13 3 4.10	+ 9.952	− 7 37 38.9	−74.27	2 44.3
27	11 0 40.95	10.618	7 31 10.1	73.24	2 40.3	27	13 7 2.86	9.945	8 7 17.2	73.90	2 44.3
28	11 4 55.31	10.578	7 1 47.1	73.66	2 40.6	28	13 11 1.46	9.939	8 36 46.2	73.50	2 44.4
29	11 9 8.71	10.539	6 32 14.4	74.05	2 40.8	29	13 14 59.91	9.933	9 6 5.2	73.08	2 44.4
30	11 13 21.18	10.501	6 2 32.6	74.42	2 41.1	30	13 18 58.22	9.927	9 35 13.8	72.63	2 44.4
31	11 17 32.76	+10.465	+ 5 32 42.4	−74.76	2 41.3	31	13 22 56.41	+ 9.922	−10 4 11.3	−72.16	2 44.4
32	11 21 43.49	+10.430	+ 5 2 44.4	−75.07	2 41.6	32	13 26 54.49	+ 9.918	−10 32 57.1	−71.66	2 44.4

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.	Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
Semidiameter . .	6.7″	6.9″	7.1″	7.3″	7.5″	7.7″	Semidiameter . .	8.0″	8.3″	8.6″	9.0″	9.4″	9.8″
Hor. Parallax . .	6.9	7.1	7.3	7.5	7.8	8.0	Hor. Parallax . .	8.3	8.6	8.9	9.3	9.7	10.1

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign − indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	13 26 54.49	+9.918	−10 32 57.1	−71.66	2 44.4	1	15 24 34.38	+9.480	−22 38 27.9	−45.84	2 43.9
2	13 30 52.46	9.914	11 1 30.7	71.14	2 44.5	2	15 28 21.33	9.431	22 56 34.0	44.66	2 43.7
3	13 34 50.36	9.911	11 29 51.5	70.59	2 44.5	3	15 32 7.04	9.378	23 14 11.5	43.46	2 43.5
4	13 38 48.18	9.908	11 57 58.9	70.02	2 44.5	4	15 35 51.43	9.320	23 31 20.2	42.25	2 43.3
5	13 42 45.94	9.905	12 25 52.3	69.43	2 44.5	5	15 39 34.39	9.258	23 47 59.6	41.02	2 43.1
6	13 46 43.63	+9.902	−12 53 31.1	−68.81	2 44.5	6	15 43 15.82	+9.192	−24 4 9.5	−39.79	2 42.9
7	13 50 41.26	9.899	13 20 54.9	68.17	2 44.5	7	15 46 55.61	9.121	24 19 49.6	38.55	2 42.6
8	13 54 38.83	9.897	13 48 3.0	67.50	2 44.5	8	15 50 33.62	9.045	24 34 59.7	37.29	2 42.3
9	13 58 36.33	9.894	14 14 54.9	66.81	2 44.6	9	15 54 9.73	8.963	24 49 39.4	36.02	2 41.9
10	14 2 33.76	9.891	14 41 29.9	66.10	2 44.6	10	15 57 43.79	8.875	25 3 48.5	34.74	2 41.5
11	14 6 31.11	+9.888	−15 7 47.6	−65.37	2 44.6	11	16 1 15.66	+8.780	−25 17 26.8	−33.45	2 41.1
12	14 10 28.38	9.884	15 33 47.4	64.61	2 44.6	12	16 4 45.18	8.679	25 30 33.9	32.15	2 40.6
13	14 14 25.54	9.880	15 59 28.7	63.83	2 44.6	13	16 8 12.19	8.571	25 43 9.8	30.84	2 40.1
14	14 18 22.58	9.874	16 24 51.0	63.02	2 44.7	14	16 11 36.52	8.455	25 55 14.2	29.52	2 39.6
15	14 22 19.47	9.867	16 49 53.6	62.19	2 44.7	15	16 14 57.97	8.332	26 6 46.9	28.19	2 39.0
16	14 26 16.17	+9.859	−17 14 35.9	−61.33	2 44.7	16	16 18 16.36	+8.200	−26 17 47.7	−26.86	2 38.4
17	14 30 12.67	9.849	17 38 57.3	60.45	2 44.7	17	16 21 31.49	8.060	26 28 16.3	25.52	2 37.7
18	14 34 8.92	9.838	18 2 57.4	59.55	2 44.7	18	16 24 43.14	7.911	26 38 12.5	24.17	2 36.9
19	14 38 4.88	9.825	18 26 35.6	58.63	2 44.7	19	16 27 51.11	7.753	26 47 36.3	22.81	2 36.1
20	14 42 0.50	9.810	18 49 51.3	57.68	2 44.7	20	16 30 55.16	7.584	26 56 27.4	21.45	2 35.2
21	14 45 55.75	+9.793	−19 12 44.0	−56.71	2 44.6	21	16 33 55.06	+7.406	−27 4 45.7	−20.08	2 34.2
22	14 49 50.56	9.774	19 35 13.1	55.71	2 44.6	22	16 36 50.55	7.217	27 12 31.1	18.70	2 33.2
23	14 53 44.89	9.753	19 57 18.0	54.69	2 44.6	23	16 39 41.40	7.018	27 19 43.3	17.32	2 32.1
24	14 57 38.68	9.729	20 18 58.2	53.65	2 44.5	24	16 42 27.34	6.808	27 26 22.3	15.93	2 30.9
25	15 1 31.86	9.702	20 40 13.2	52.59	2 44.5	25	16 45 8.11	6.588	27 32 27.8	14.53	2 29.6
26	15 5 24.36	+9.673	−21 1 2.5	−51.51	2 44.4	26	16 47 43.46	+6.356	−27 37 59.7	−13.13	2 28.3
27	15 9 16.13	9.641	21 21 25.6	50.41	2 44.4	27	16 50 13.10	6.113	27 42 57.9	11.72	2 26.9
28	15 13 7.09	9.606	21 41 22.1	49.29	2 44.3	28	16 52 36.77	5.858	27 47 22.2	10.30	2 25.3
29	15 16 57.17	9.568	22 0 51.6	48.16	2 44.2	29	16 54 54.17	5.591	27 51 12.4	8.87	2 23.6
30	15 20 46.30	9.526	22 19 53.6	47.01	2 44.1	30	16 57 5.03	5.312	27 54 28.3	7.44	2 21.8
31	15 24 34.38	+9.480	−22 38 27.9	−45.84	2 43.9	31	16 59 9.06	+5.022	−27 57 9.6	− 6.00	2 20.0
32	15 28 21.33	+9.431	−22 56 34.0	−44.66	2 43.7	32	17 1 5.99	+4.790	−27 59 16.1	− 4.55	2 18.0

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.	Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
Semidiameter . .	10.″2	10.″7	11.″3	11.″9	12.″5	13.″3	Semidiameter . .	14.″2	15.″1	16.″2	17.″4	18.″8	20.″3
Hor. Parallax . .	10.6	11.1	11.6	12.3	13.0	13.8	Hor. Parallax . .	14.6	15.6	16.8	18.0	19.4	21.1

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	17 1 5.99	+4.720	−27 59 16.1	− 4.55	2 18.0
2	17 2 55.52	4.405	28 0 47.6	3.08	2 15.9
3	17 4 37.34	4.078	28 1 43.6	1.60	2 13.6
4	17 6 11.16	3.739	28 2 3.8	− 0.10	2 11.2
5	17 7 36.70	3.388	28 1 47.8	+ 1.43	2 8.7
6	17 8 53.66	+3.024	−28 0 54.8	+ 2.98	2 6.0
7	17 10 1.76	2.649	27 59 24.3	4.56	2 3.2
8	17 11 0.71	2.262	27 57 15.8	6.16	2 0.3
9	17 11 50.25	1.864	27 54 28.5	7.79	1 57.2
10	17 12 30.10	1.455	27 51 1.6	9.46	1 53.9
11	17 13 0.03	+1.038	−27 46 54.0	+11.17	1 50.4
12	17 13 19.83	0.611	27 42 5.0	12.92	1 46.8
13	17 13 29.30	+0.176	27 36 33.7	14.71	1 43.0
14	17 13 28.25	−0.265	27 30 18.8	16.55	1 39.1
15	17 13 16.56	0.710	27 23 19.1	18.43	1 35.0
16	17 12 54.15	−1.158	−27 15 33.7	+20.36	1 30.7
17	17 12 20.97	1.606	27 7 1.7	22.33	1 26.2
18	17 11 37.08	2.051	26 57 41.9	24.33	1 21.4
19	17 10 42.57	2.491	26 47 33.6	26.36	1 16.5
20	17 9 37.58	2.923	26 36 36.1	28.43	1 11.5
21	17 8 22.35	−3.344	−26 24 48.8	+30.51	1 6.3
22	17 6 57.21	3.749	26 12 11.3	32.60	1 1.0
23	17 5 22.60	4.133	25 58 43.6	34.68	0 55.5
24	17 3 39.02	4.494	25 44 26.3	36.73	0 49.9
25	17 1 47.08	4.829	25 29 20.4	38.74	0 44.1
26	16 59 47.46	−5.134	−25 13 27.2	+40.66	0 38.2
27	16 57 40.91	5.405	24 56 48.6	42.52	0 32.2
28	16 55 28.32	5.639	24 39 27.0	44.25	0 26.0
29	16 53 10.58	5.833	24 21 25.6	45.84	0 19.8
30	16 50 48.68	5.984	24 2 47.8	47.27	0 13.5
31	16 48 23.65	−6.093	−23 43 38.0	+48.51	0 7.2
32	16 45 56.57	−6.157	−23 24 0.9	+49.54	0 0.8 23 54.4

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter . . .	22″.1	24″.0	26″.0	28″.1	30″.0	31″.5
Hor. Parallax . . .	22.9	24.9	27.0	29.1	31.1	32.6

DECEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	16 48 23.65	−6.093	−23 43 38.0	+48.51	0 7.2
2	16 45 56.57	6.157	23 24 0.9	49.54	0 0.8 23 54.4
3	16 43 28.47	6.177	23 4 1.8	50.34	23 48.0
4	16 41 0.44	6.151	22 43 46.3	50.90	23 41.7
5	16 38 33.58	6.080	22 23 20.4	51.21	23 35.4
6	16 36 8.92	−5.968	−22 2 50.1	+51.26	23 29.2
7	16 33 47.44	5.815	21 42 21.7	51.06	23 23.0
8	16 31 30.09	5.622	21 22 1.8	50.57	23 16.9
9	16 29 17.77	5.396	21 1 56.5	49.83	23 10.8
10	16 27 11.27	5.138	20 42 12.0	48.84	23 4.9
11	16 25 11.34	−4.850	−20 22 54.0	+47.62	22 59.1
12	16 23 18.66	4.536	20 4 7.8	46.18	22 53.4
13	16 21 33.82	4.198	19 45 58.5	44.55	22 47.8
14	16 19 57.30	3.841	19 28 30.7	42.73	22 42.4
15	16 18 29.55	3.469	19 11 48.5	40.76	22 37.1
16	16 17 10.90	−3.083	−18 55 55.5	+38.65	22 32.0
17	16 16 1.66	2.686	18 40 54.5	36.42	22 27.1
18	16 15 2.04	2.281	18 26 48.1	34.11	22 22.4
19	16 14 12.20	1.872	18 13 38.1	31.72	22 17.8
20	16 13 32.21	1.460	18 1 26.0	29.29	22 13.4
21	16 13 2.13	−1.047	−17 50 12.7	+26.82	22 9.1
22	16 12 41.96	0.635	17 39 58.6	24.36	22 5.0
23	16 12 31.64	−0.225	17 30 43.8	21.89	22 1.0
24	16 12 31.11	+0.191	17 22 27.9	19.45	21 57.2
25	16 12 40.26	0.581	17 15 10.2	17.04	21 53.5
26	16 12 58.94	+0.974	−17 8 49.6	+14.68	21 50.0
27	16 13 26.96	1.360	17 3 24.9	12.38	21 46.7
28	16 14 4.16	1.738	16 58 54.6	10.15	21 43.6
29	16 14 50.33	2.107	16 55 17.0	8.00	21 40.6
30	16 15 45.24	2.466	16 52 29.8	5.94	21 37.7
31	16 16 48.67	+2.816	−16 50 31.3	+ 3.96	21 35.0
32	16 18 0.38	+3.156	−16 49 19.1	+ 2.08	21 32.3

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	32d.
Semidiameter . .	32″.2	32″.1	31″.1	29″.6	27″.6	25″.5	23″.5
Hor. Parallax . .	33.4	33.2	32.2	30.6	28.5	26.4	24.3

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	13 54 42.52	+5.351	−10 13 33.9	−29.54	19 8.9
2	13 56 50.88	5.346	10 25 20.5	29.34	19 7.1
3	13 58 59.11	5.340	10 37 2.1	29.13	19 5.3
4	14 1 7.22	5.335	10 48 38.7	28.92	19 3.5
5	14 3 15.20	5.330	11 0 10.2	28.71	19 1.7
6	14 5 23.05	+5.324	−11 11 36.6	−28.49	18 59.9
7	14 7 30.77	5.318	11 22 57.8	28.27	18 58.1
8	14 9 38.35	5.312	11 34 13.7	28.05	18 56.2
9	14 11 45.78	5.306	11 45 24.4	27.83	18 54.4
10	14 13 53.05	5.300	11 56 29.7	27.61	18 52.6
11	14 16 0.17	+5.294	−12 7 29.6	−27.38	18 50.8
12	14 18 7.13	5.287	12 18 24.0	27.15	18 49.0
13	14 20 13.91	5.280	12 29 12.9	26.92	18 47.1
14	14 22 20.51	5.272	12 39 56.2	26.68	18 45.3
15	14 24 26.91	5.264	12 50 33.8	26.44	18 43.4
16	14 26 33.11	+5.255	−13 1 5.6	−26.20	18 41.6
17	14 28 39.09	5.245	13 11 31.6	25.96	18 39.8
18	14 30 44.84	5.236	13 21 51.8	25.72	18 37.9
19	14 32 50.36	5.225	13 32 6.0	25.47	18 36.1
20	14 34 55.63	5.214	13 42 14.2	25.22	18 34.2
21	14 37 0.65	+5.203	−13 52 16.3	−24.97	18 32.4
22	14 39 5.40	5.192	14 2 12.4	24.72	18 30.5
23	14 41 9.87	5.180	14 12 2.4	24.46	18 28.6
24	14 43 14.05	5.168	14 21 46.1	24.20	18 26.8
25	14 45 17.94	5.156	14 31 23.7	23.94	18 24.9
26	14 47 21.53	+5.143	−14 40 55.1	−23.68	18 23.0
27	14 49 24.80	5.130	14 50 20.2	23.42	18 21.1
28	14 51 27.75	5.116	14 59 39.1	23.16	18 19.2
29	14 53 30.37	5.102	15 8 51.7	22.89	18 17.3
30	14 55 32.65	5.088	15 17 58.0	22.63	18 15.4
31	14 57 34.58	+5.073	−15 26 57.9	−22.37	18 13.5
32	14 59 36.15	+5.058	−15 35 51.5	−22.11	18 11.6

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	3.″0	3.″1	3.″2	3.″3	3.″4	3.″5	3.″6
Hor. Parallax . .	5.2	5.4	5.6	5.7	5.9	6.2	6.4

FEBRUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	14 59 36.15	+5.058	−15 35 51.5	−22.11	18 11.6
2	15 1 37.35	5.042	15 44 38.9	21.85	18 9.6
3	15 3 38.17	5.026	15 53 20.0	21.58	18 7.7
4	15 5 38.59	5.009	16 1 54.7	21.32	18 5.8
5	15 7 38.61	4.992	16 10 23.1	21.05	18 3.9
6	15 9 38.21	+4.974	−16 18 45.1	−20.79	18 1.9
7	15 11 37.38	4.955	16 27 0.8	20.52	17 59.9
8	15 13 36.08	4.936	16 35 10.1	20.26	17 58.0
9	15 15 34.31	4.916	16 43 13.0	19.99	17 56.0
10	15 17 32.05	4.895	16 51 9.5	19.73	17 54.0
11	15 19 29.28	+4.874	−16 58 59.5	−19.46	17 52.0
12	15 21 25.99	4.852	17 6 43.1	19.19	17 50.0
13	15 23 22.14	4.828	17 14 20.2	18.92	17 48.0
14	15 25 17.72	4.803	17 21 50.9	18.65	17 46.0
15	15 27 12.69	4.777	17 29 15.2	18.38	17 43.9
16	15 29 7.04	+4.751	−17 36 32.9	−18.11	17 41.9
17	15 31 0.75	4.724	17 43 44.1	17.84	17 39.9
18	15 32 53.80	4.696	17 50 48.9	17.57	17 37.8
19	15 34 46.17	4.667	17 57 47.2	17.30	17 35.7
20	15 36 37.82	4.637	18 4 39.0	17.03	17 33.6
21	15 38 28.74	+4.606	−18 11 24.4	−16.77	17 31.5
22	15 40 18.91	4.574	18 18 3.4	16.50	17 29.4
23	15 42 8.30	4.542	18 24 36.0	16.23	17 27.3
24	15 43 56.90	4.509	18 31 2.4	15.97	17 25.1
25	15 45 44.68	4.474	18 37 22.5	15.71	17 23.0
26	15 47 31.62	+4.438	−18 43 36.3	−15.45	17 20.8
27	15 49 17.71	4.401	18 49 44.0	15.19	17 18.6
28	15 51 2.90	4.364	18 55 45.5	14.94	17 16.4
29	15 52 47.19	4.326	19 1 41.1	14.69	17 14.2
30	15 54 30.56	4.287	19 7 30.6	14.45	17 12.0
31	15 56 12.98	+4.247	−19 13 14.3	−14.20	17 9.8
32	15 57 54.42	+4.205	−19 18 52.1	−13.96	17 7.5

Day of the Month.	5th.	10th.	15th.	20th.	25th.
Semidiameter.	3.″8	3.″9	4.″1	4.″3	4.″5
Hor. Parallax	6.6	6.9	7.2	7.5	7.8

NOTE.—The sign + indicates north declinations: the sign — indicates south declinations.

GREENWICH MEAN TIME.

MARCH.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	15 52 47.19	+4.326	−19 1 41.1	−14.69	17 14.2
2	15 54 30.56	4.287	19 7 30.6	14.45	17 12.0
3	15 56 12.98	4.247	19 13 14.3	14.20	17 9.8
4	15 57 54.42	4.206	19 18 52.1	13.96	17 7.5
5	15 59 34.85	4.162	19 24 24.1	13.72	17 5.2
6	16 1 14.24	+4.118	−19 29 50.4	−13.48	17 2.9
7	16 2 52.57	4.074	19 35 11.0	13.25	17 0.6
8	16 4 29.81	4.028	19 40 26.0	13.02	16 58.3
9	16 6 5.91	3.980	19 45 35.5	12.79	16 55.9
10	16 7 40.84	3.930	19 50 39.4	12.56	16 53.6
11	16 9 14.57	+3.879	−19 55 37.9	−12.33	16 51.2
12	16 10 47.05	3.826	20 0 31.1	12.11	16 48.8
13	16 12 18.25	3.772	20 5 18.9	11.89	16 46.3
14	16 13 48.12	3.716	20 10 1.5	11.67	16 43.9
15	16 15 16.62	3.658	20 14 38.8	11.45	16 41.4
16	16 16 43.71	+3.599	−20 19 11.0	−11.24	16 38.9
17	16 18 9.35	3.538	20 23 38.1	11.03	16 36.4
18	16 19 33.50	3.475	20 28 0.3	10.82	16 33.8
19	16 20 56.11	3.409	20 32 17.5	10.62	16 31.2
20	16 22 17.15	3.342	20 36 29.8	10.42	16 28.6
21	16 23 36.56	+3.274	−20 40 37.5	−10.22	16 26.0
22	16 24 54.31	3.204	20 44 40.6	10.03	16 23.3
23	16 26 10.36	3.132	20 48 39.2	9.84	16 20.6
24	16 27 24.69	3.059	20 52 33.3	9.66	16 17.9
25	16 28 37.23	2.984	20 56 23.1	9.48	16 15.2
26	16 29 47.94	+2.908	−21 0 8.7	− 9.31	16 12.4
27	16 30 56.79	2.830	21 3 50.2	9.15	16 9.6
28	16 32 3.74	2.749	21 7 27.8	8.99	16 6.8
29	16 33 8.76	2.667	21 11 1.6	8.83	16 3.9
30	16 34 11.80	2 584	21 14 31.7	8.68	16 1.0
31	16 35 12.81	+2.499	−21 17 58.1	− 8.53	15 58.0
32	16 36 11.74	+2.411	−21 21 21.1	− 8.38	15 55.0

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter . .	4″.7	4″.9	5″.1	5″.4	5″.7	6″.0
Hor. Parallax . .	8.2	8.6	9.0	9.4	9.9	10.4

APRIL.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	16 36 11.74	+2.411	−21 21 21.1	−8.38	15 55.0
2	16 37 8.54	2.321	21 24 40.7	8.24	15 52.0
3	16 38 3.18	2.230	21 27 56.9	8.11	15 49.0
4	16 38 55.59	2.137	21 31 9.9	7.98	15 45.9
5	16 39 45.73	2.041	21 34 19.9	7.85	15 42.8
6	16 40 33.55	+1.943	−21 37 26.9	−7.72	15 39.7
7	16 41 18.99	1.843	21 40 30.8	7.60	15 36.4
8	16 42 1.99	1.740	21 43 31.8	7.48	15 33.1
9	16 42 42.48	1.634	21 46 30.0	7.36	15 29.8
10	16 43 20.42	1.526	21 49 25.4	7.25	15 26.5
11	16 43 55.75	+1.416	−21 52 18.1	−7.14	15 23.1
12	16 44 28.41	1.304	21 55 8.1	7.03	15 19.7
13	16 44 58.33	1.188	21 57 55.4	6.92	15 16.2
14	16 45 25.46	1.071	22 0 40.0	6.81	15 12.7
15	16 45 49.76	0.952	22 3 22.1	6.70	15 9.2
16	16 46 11.18	+0.832	−22 6 1.7	−6.59	15 5.6
17	16 46 29.65	0.708	22 8 38.7	6.48	15 1.9
18	16 46 45.13	0.581	22 11 13.1	6.38	14 58.2
19	16 46 57.56	0.453	22 13 45.0	6.27	14 54.5
20	16 47 6.92	0.325	22 16 14.3	6.17	14 50.7
21	16 47 13.19	+0.196	−22 18 41.2	−6.06	14 46.8
22	16 47 16.33	+0.066	22 21 5.6	5.96	14 42.9
23	16 47 16.31	−0.067	22 23 27.3	5.85	14 38.9
24	16 47 13.09	0.201	22 25 46.6	5.75	14 34.9
25	16 47 6.65	0.336	22 28 3.3	5.64	14 30.8
26	16 46 56.98	−0.470	−22 30 17.4	−5.53	14 26.7
27	16 46 44.08	0.605	22 32 28.8	5.42	14 22.5
28	16 46 27.92	0.742	22 34 37.4	5.30	14 18.3
29	16 46 8.48	0.878	22 36 43.4	5.18	14 14.0
30	16 45 45.76	1.015	22 38 46.3	5.06	14 9.7
31	16 45 19.76	−1.151	−22 40 46.1	−4.93	14 5.3
32	16 44 50.48	−1.288	−22 42 42.6	−4.79	14 0.8

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.
Semidiameter . .	6″.3	6″.6	7″.0	7″.4	7″.8	8″.2
Hor. Parallax . .	11.0	11.6	12.2	12.9	13.6	14.3

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The — sign indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	16 45 19.76	−1.151	−22 40 46.1	−4.93	14 5.3
2	16 44 50.48	1.288	22 42 42.6	4.79	14 0.8
3	16 44 17.93	1.424	22 44 35.9	4.65	13 56.3
4	16 43 42.11	1.560	22 46 25.6	4.50	13 51.8
5	16 43 3.03	1.696	22 48 11.7	4.34	13 47.2
6	16 42 20.72	−1.830	−22 49 53.8	−4.17	13 42.5
7	16 41 35.20	1.962	22 51 31.9	3.99	13 37.8
8	16 40 46.51	2.094	22 53 5.6	3.81	13 33.0
9	16 39 54.68	2.224	22 54 34.8	3.62	13 28.2
10	16 38 59.76	2.351	22 55 59.3	3.42	13 23.3
11	16 38 1.81	−2.476	−22 57 18.7	−3.21	13 18.4
12	16 37 0.92	2.598	22 58 33.0	2.99	13 13.5
13	16 35 57.12	2.716	22 59 41.8	2.76	13 8.5
14	16 34 50.55	2.830	23 0 45.0	2.52	13 3.4
15	16 33 41.30	2.939	23 1 42.4	2.27	12 58.3
16	16 32 29.50	−3.043	−23 2 34.0	−2.02	12 53.1
17	16 31 15.25	3.142	23 3 19.4	1.77	12 47.9
18	16 29 58.70	3.234	23 3 58.7	1.51	12 42.7
19	16 28 40.02	3.320	23 4 31.7	1.25	12 37.5
20	16 27 19.35	3.400	23 4 58.4	0.98	12 32.2
21	16 25 56.84	−3.472	−23 5 18.9	−0.72	12 26.9
22	16 24 32.69	3.537	23 5 33.0	0.45	12 21.6
23	16 23 7.07	3.594	23 5 40.7	−0.19	12 16.2
24	16 21 40.17	3.643	23 5 42.2	+0.07	12 10.8
25	16 20 12.18	3.684	23 5 37.5	0.32	12 5.4
26	16 18 43.29	−3.718	−23 5 26.9	+0.57	12 0.0
27	16 17 13.70	3.743	23 5 10.4	0.81	11 54.6
28	16 15 43.61	3.760	23 4 48.3	1.04	11 49.2
29	16 14 13.22	3.769	23 4 20.7	1.26	11 43.7
30	16 12 42.71	3.770	23 3 47.8	1.47	11 38.3
31	16 11 12.28	−3.762	−23 3 10.0	+1.67	11 32.9
32	16 9 42.12	−3.747	−23 2 27.4	+1.86	11 27.4

JUNE.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	16 9 42.12	−3.747	−23 2 27.4	+1.86	11 27.4
2	16 8 12.41	3.724	23 1 40.4	2.04	11 22.0
3	16 6 43.36	3.692	23 0 49.4	2.20	11 16.6
4	16 5 15.18	3.653	22 59 54.7	2.35	11 11.2
5	16 3 48.03	3.606	22 58 56.8	2.48	11 5.8
6	16 2 22.09	−3.552	−22 57 55.9	+2.59	11 0.5
7	16 0 57.52	3.491	22 56 52.5	2.68	10 55 2
8	15 59 34.51	3.423	22 55 47.2	2.75	10 49.9
9	15 58 13.24	3.347	22 54 40.4	2.79	10 44.6
10	15 56 53.87	3.264	22 53 32.4	2.81	10 39.4
11	15 55 36.58	−3.174	−22 52 24.0	+2.81	10 34.2
12	15 54 21.54	3.077	22 51 15.7	2.80	10 29.1
13	15 53 8.88	2.975	22 50 8.0	2.77	10 24.0
14	15 51 58.75	2.867	22 49 1.5	2.73	10 18.9
15	15 50 51.28	2.752	22 47 56.7	2.66	10 13.9
16	15 49 46.64	−2.632	−22 46 54.4	+2.56	10 8.9
17	15 48 44.93	2.506	22 45 55.0	2.43	10 4.0
18	15 47 46.24	2.380	22 44 58.8	2.27	9 59.1
19	15 46 50.70	2.246	22 44 6.7	2.08	9 54.2
20	15 45 58.42	2.110	22 43 19.2	1.87	9 49.4
21	15 45 9.44	−1.970	−22 42 36.6	+1.65	9 44.7
22	15 44 23.86	1.828	22 41 59.3	1.42	9 40.0
23	15 43 41.71	1.683	22 41 27.8	1.18	9 35.4
24	15 43 3.07	1.537	22 41 2.4	0.92	9 30.9
25	15 42 27.96	1.388	22 40 43.5	0.64	9 26.4
26	15 41 56.42	−1.239	−22 40 31.4	+0.35	9 22.0
27	15 41 28.47	1.090	22 40 26.4	+0.05	9 17.6
28	15 41 4.10	0.940	22 40 28.6	−0.25	9 13.3
29	15 40 43.33	0.790	22 40 38.3	0.56	9 9.0
30	15 40 26.17	0.640	22 40 55.5	0.88	9 4.8
31	15 40 12.61	−0.491	−22 41 20.4	−1.20	9 0.7
32	15 40 2.62	−0.342	−22 41 53.0	−1.52	8 56.6

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	8″.6	9″.0	9″.4	9″.7	10″.0	10″.2	10″.4
Hor. Parallax . .	15.1	15.8	16.5	17.1	17.6	17.9	18.2

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter . .	10″.4	10″.4	10″.2	10″.0	9″.8	9″.5
Hor. Parallax . .	18.2	18.2	17.9	17.6	17.1	16.6

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

	JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.	Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	15 40 12.61	−0.491	−22 41 20.4	−1.20	9 0.7	1	16 0 43.36	+3.546	−23 53 56.5	−9.33	7 19.8
2	15 40 2.62	0.342	22 41 53.0	1.52	8 56.6	2	16 2 9.69	3.647	23 57 41.8	9.43	7 17.3
3	15 39 56.20	0.193	22 42 33.5	1.85	8 52.6	3	16 3 38.42	3.747	24 1 29.3	9.52	7 14.8
4	15 39 53.35	−0.045	22 43 21.9	2.18	8 48.6	4	16 5 9.52	3.845	24 5 18.7	9.59	7 12.4
5	15 39 54.03	+0.101	22 44 18.1	2.51	8 44.7	5	16 6 42.96	3.941	24 9 9.6	9.65	7 10.0
6	15 39 58.22	+0.248	−22 45 22.2	−2.84	8 40.9	6	16 8 18.70	+4.036	−24 13 1.8	−9.70	7 7.7
7	15 40 5.91	0.394	22 46 34.3	3.17	8 37.1	7	16 9 56.70	4.130	24 16 54.8	9.73	7 5.4
8	15 40 17.08	0.538	22 47 54.1	3.49	8 33.4	8	16 11 36.92	4.222	24 20 48.5	9.75	7 3.2
9	15 40 31.70	0.681	22 49 21.8	3.82	8 29.7	9	16 13 19.34	4.313	24 24 42.6	9.75	7 1.0
10	15 40 49.74	0.822	22 50 57.3	4.14	8 26.1	10	16 15 3.91	4.403	24 28 36.8	9.74	6 58.8
11	15 41 11.18	+0.963	−22 52 40.6	−4.46	8 22.6	11	16 16 50.64	+4.491	−24 32 30.7	−9.72	6 56.6
12	15 41 35.98	1.103	22 54 31.5	4.78	8 19.1	12	16 18 39.47	4.578	24 36 24.2	9.69	6 54.5
13	15 42 4.14	1.242	22 56 30.0	5.10	8 15.6	13	16 20 30.37	4.664	24 40 16.7	9.66	6 52.4
14	15 42 35.65	1.380	22 58 36.1	5.41	8 12.2	14	16 22 23.31	4.748	24 44 8.0	9.62	6 50.4
15	15 43 10.45	1.518	23 0 49.5	5.71	8 8.9	15	16 24 18.28	4.831	24 47 58.0	9.56	6 48.4
16	15 43 48.51	+1.653	−23 3 10.2	−6.00	8 5.6	16	16 26 15.23	+4.913	−24 51 46.3	−9.48	6 46.4
17	15 44 29.77	1.786	23 5 37.9	6.29	8 2.4	17	16 28 14.11	4.993	24 55 32.5	9.38	6 44.4
18	15 45 14.19	1.916	23 8 12.4	6.57	7 59.2	18	16 30 14.89	5.072	24 59 16.4	9.27	6 42.5
19	15 46 1.73	2.045	23 10 53.6	6.85	7 56.1	19	16 32 17.56	5.149	25 2 57.5	9.15	6 40.6
20	15 46 52.37	2.173	23 13 41.2	7.12	7 53.0	20	16 34 22.07	5.224	25 6 35.7	9.02	6 38.8
21	15 47 46.06	+2.300	−23 16 35.1	−7.37	7 50.0	21	16 36 28.40	+5.298	−25 10 10.6	−8.87	6 37.0
22	15 48 42.75	2.424	23 19 35.0	7.61	7 47.0	22	16 38 36.49	5.371	25 13 41.9	8.71	6 35.2
23	15 49 42.39	2.546	23 22 40.5	7.84	7 44.1	23	16 40 46.28	5.443	25 17 9.1	8.54	6 33.4
24	15 50 44.92	2.665	23 25 51.5	8.06	7 41.2	24	16 42 57.76	5.514	25 20 32.1	8.36	6 31.6
25	15 51 50.30	2.782	23 29 7.6	8.26	7 38.4	25	16 45 10.90	5.582	25 23 50.5	8.17	6 29.9
26	15 52 58.48	+2.897	−23 32 28.5	−8.45	7 35.6	26	16 47 25.66	+5.648	−25 27 4.0	−7.96	6 28.2
27	15 54 9.40	3.011	23 35 53.8	8.63	7 32.8	27	16 49 42.01	5.712	25 30 12.3	7.74	6 26.6
28	15 55 23.01	3.122	23 39 23.3	8.80	7 30.1	28	16 51 59.90	5.776	25 33 15.1	7.50	6 24.9
29	15 56 39.27	3.231	23 42 56.7	8.96	7 27.5	29	16 54 19.30	5.839	25 36 12.1	7.25	6 23.3
30	15 57 58.11	3.338	23 46 33.6	9.10	7 24.9	30	16 56 40.18	5.901	25 39 3.0	6.99	6 21.7
31	15 59 19.49	+3.443	−23 50 13.7	−9.22	7 22.3	31	16 59 2.52	+5.961	−25 41 47.4	−6.72	6 20.2
32	16 0 43.36	+3.546	−23 53 56.5	−9.33	7 19.8	32	17 1 26.28	+6.019	−25 44 25.1	−6.44	6 18.6

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.	Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
Semidiameter . .	9″.2	8″.9	8″.6	8″.2	7″.9	7″.6	Semidiameter . .	7″.3	7″.1	6″.8	6″.6	6″.3	6″.1
Hor. Parallax . .	16.1	15.5	15.0	14.4	13.9	13.4	Hor. Parallax . .	12.9	12.4	11.9	11.5	11.1	10.7

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	17 1 26.28	+6.019	−25 44 25.1	−6.44	6 18.6
2	17 3 51.42	6.076	25 46 56.0	6.14	6 17.1
3	17 6 17.93	6.132	25 49 19.7	5.83	6 15.6
4	17 8 45.78	6.188	25 51 35.9	5.51	6 14.1
5	17 11 14.96	6.243	25 53 44.6	5.18	6 12.7
6	17 13 45.44	+6.297	−25 55 45.4	−4.85	6 11.3
7	17 16 17.20	6.349	25 57 38.1	4 51	6 9.9
8	17 18 50.20	6.400	25 59 22.2	4.16	6 8.5
9	17 21 24.42	6.451	26 0 57.7	3.80	6 7.1
10	17 23 59.85	6.501	26 2 24.5	3.43	6 5.8
11	17 26 36.46	+6.549	−26 3 42.2	−3.05	6 4.4
12	17 29 14.24	6.597	26 4 50.7	2.66	6 3.1
13	17 31 53.16	6.644	26 5 49.7	2.26	6 1.8
14	17 34 33.18	6.690	26 6 39.0	1.85	6 0.6
15	17 37 14.28	6.735	26 7 18.4	1.43	5 59.3
16	17 39 56.43	+6.778	−26 7 47.7	−1.01	5 58.1
17	17 42 39.61	6.819	26 8 6.7	0.58	5 56.9
18	17 45 23.77	6.860	26 8 15.2	−0.14	5 55.7
19	17 48 8.90	6.900	26 8 12.9	+0.31	5 54.5
20	17 50 54.96	6.938	26 7 59.7	0.77	5 53.3
21	17 53 41.92	+6.975	−26 7 35.4	+1.24	5 52.2
22	17 56 29.74	7.010	26 6 59.8	1.72	5 51.0
23	17 59 18.40	7.044	26 6 12.7	2.21	5 49.9
24	18 2 7.86	7.077	26 5 14.0	2.70	5 48.8
25	18 4 58.09	7.109	26 4 3.6	3.19	5 47.7
26	18 7 49.07	+7.139	−26 2 41.3	+3.69	5 46.6
27	18 10 40.76	7.168	26 1 6.8	4.19	5 45.5
28	18 13 33.13	7.196	25 59 20.1	4.70	5 44.4
29	18 16 26.16	7.222	25 57 21.1	5.22	5 43.4
30	18 19 19.83	7.247	25 55 9.6	5.74	5 42.3
31	18 22 14.11	+7.272	−25 52 45.6	+6.26	5 41.3
32	18 25 8.98	+7.296	−25 50 9.0	+6.79	5 40.3

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
Semidiameter . .	5″.9	5″.7	5″.5	5″.4	5″.2	5″.1
Hor. Parallax . .	10.4	10.0	9.7	9.4	9.2	8.9

OCTOBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	18 22 14.11	+7.272	−25 52 45.6	+ 6.26	5 41.3
2	18 25 8.98	7.296	25 50 9.0	6.79	5 40.3
3	18 28 4.41	7.320	25 47 19.5	7.32	5 39.3
4	18 31 0.39	7.343	25 44 17.2	7.86	5 38.3
5	18 33 56.90	7.365	25 41 2.0	8.40	5 37.3
6	18 36 53.91	+7.385	−25 37 33.7	+ 8.95	5 36.3
7	18 39 51.40	7.405	25 33 52.3	9.50	5 35.3
8	18 42 49.35	7.424	25 29 57.8	10.05	5 34.3
9	18 45 47.75	7.442	25 25 50.0	10.60	5 33.3
10	18 48 46.58	7.459	25 21 28.9	11.15	5 32.4
11	18 51 45.81	+7.475	−25 16 54.5	+11.71	5 31.4
12	18 54 45.42	7.491	25 12 6.6	12.27	5 30.5
13	18 57 45.39	7.506	25 7 5.3	12.83	5 29.6
14	19 0 45.69	7.520	25 1 50.5	13.39	5 28.6
15	19 3 46.30	7.532	24 56 22.1	13.96	5 27.7
16	19 6 47.19	+7.543	−24 50 40.3	+14.52	5 26.8
17	19 9 48.35	7.553	24 44 44.8	15.09	5 25.8
18	19 12 49.73	7.562	24 38 35.8	15.65	5 24.9
19	19 15 51.32	7.570	24 32 13.2	16.22	5 24.0
20	19 18 53.10	7.578	24 25 37.1	16.78	5 23.1
21	19 21 55.04	+7.584	−24 18 47.5	+17.35	5 22.2
22	19 24 57.11	7.589	24 11 44.3	17.91	5 21.3
23	19 27 59.29	7.593	24 4 27.6	18.47	5 20.4
24	19 31 1.55	7.596	23 56 57.4	19.03	5 19.5
25	19 34 3.88	7.598	23 49 13.7	19.59	5 18.6
26	19 37 6.25	+7.599	−23 41 16.7	+20.15	5 17.6
27	19 40 8.64	7.600	23 33 6.4	20.71	5 16.7
28	19 43 11.05	7.600	23 24 42.8	21.26	5 15.8
29	19 46 13.45	7.599	23 16 5.9	21.81	5 14.9
30	19 49 15.82	7.598	23 7 15.9	22.36	5 14.0
31	19 52 18.15	+7.596	−22 58 12.9	+22.90	5 13.1
32	19 55 20.42	+7.594	−22 48 56.8	+23.44	5 12.2

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
Semidiameter . .	4″.9	4″.8	4″.6	4″.5	4″.4	4″.3
Hor. Parallax . .	8.6	8.4	8.1	7.9	7.7	7.5

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.						DECEMBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	19 55 20.42	+7.594	−22 48 56.8	+23.44	5 12.2	1	21 25 7.89	+7.312	−16 38 46.9	+37.38	4 43.7
2	19 58 22.63	7.591	22 39 27.8	23.98	5 11.3	2	21 28 3.19	7.298	16 23 45.4	37.74	4 42.7
3	20 1 24.77	7.587	22 29 45.9	24.51	5 10.4	3	21 30 58.17	7.284	16 8 35.2	38.10	4 41.7
4	20 4 26.81	7.583	22 19 51.3	25.04	5 9.5	4	21 33 52.82	7.271	15 53 16.5	38.45	4 40.6
5	20 7 28.74	7.579	22 9 44.0	25.57	5 8.6	5	21 36 47.15	7.258	15 37 49.4	38.80	4 39.6
6	20 10 30.57	+7.574	−21 59 24.1	+26.09	5 7.7	6	21 39 41.16	+7.244	−15 22 14.2	+39.14	4 38.5
7	20 13 32.28	7.569	21 48 51.7	26.61	5 6.8	7	21 42 34.84	7.230	15 6 30.9	39.47	4 37.5
8	20 16 33.86	7.563	21 38 6.7	27.12	5 5.9	8	21 45 28.20	7.216	14 50 39.7	39.79	4 36.5
9	20 19 35.30	7.556	21 27 9.6	27.63	5 5.0	9	21 48 21.24	7.203	14 34 40.8	40.11	4 35.4
10	20 22 36.58	7.550	21 16 0.2	28.14	5 4.1	10	21 51 13.96	7.190	14 18 34.5	40.42	4 34.4
11	20 25 37.69	+7.543	−21 4 38.8	+28.64	5 3.2	11	21 54 6.38	+7.177	−14 2 20.7	+40.72	4 33.3
12	20 28 38.62	7.535	20 53 5.4	29.13	5 2.2	12	21 56 58.47	7.164	13 45 59.8	41.01	4 32.2
13	20 31 39.36	7.527	20 41 20.1	29.62	5 1.3	13	21 59 50.24	7.150	13 29 31.9	41.29	4 31.2
14	20 34 39.90	7.518	20 29 23.1	30.11	5 0.3	14	22 2 41.69	7.137	13 12 57.3	41.57	4 30.1
15	20 37 40.23	7.509	20 17 14.5	30.59	4 59.4	15	22 5 32.82	7.124	12 56 16.0	41.85	4 29.0
16	20 40 40.34	+7.499	−20 4 54.4	+31.07	4 58 4	16	22 8 23.62	+7.110	−12 39 28.3	+42.12	4 27.9
17	20 43 40.20	7.489	19 52 23.1	31.54	4 57.5	17	22 11 14.10	7.096	12 22 34.4	42.38	4 26.8
18	20 46 39.81	7.478	19 39 40.6	32.00	4 56.5	18	22 14 4.26	7.083	12 5 34.5	42.63	4 25.7
19	20 49 39.16	7.467	19 26 47.1	32.45	4 55.6	19	22 16 54.10	7.069	11 48 28.9	42.87	4 24.6
20	20 52 38.23	7.456	19 13 42.7	32.90	4 54.6	20	22 19 43.61	7.056	11 31 17.6	43.09	4 23 5
21	20 55 37.03	+7.444	−19 0 27.7	+33.34	4 53.7	21	22 22 32.81	+7.043	−11 14 0.9	+43.30	4 22.3
22	20 58 35.53	7.431	18 47 2.2	33.78	4 52.7	22	22 25 21.69	7.030	10 56 39.0	43.50	4 21.2
23	21 1 33.73	7.418	18 33 26.3	34.21	4 51.7	23	22 28 10.26	7.017	10 39 12.0	43.70	4 20.1
24	21 4 31.62	7.405	18 19 40.2	34.63	4 50.7	24	22 30 58.51	7.004	10 21 40.2	43.90	4 19.0
25	21 7 29.20	7.392	18 5 44.2	35.04	4 49.8	25	22 33 46.45	6.991	10 4 3.8	44.10	4 17.8
26	21 10 26.46	+7.379	−17 51 38.3	+35.45	4 48.8	26	22 36 34.09	+6.979	− 9 46 23.0	+44.29	4 16.7
27	21 13 23.40	7.366	17 37 22.7	35.85	4 47.8	27	22 39 21.44	6.967	9 28 37.9	44.47	4 15.5
28	21 16 20.01	7.353	17 22 57.6	36.24	4 46.8	28	22 42 8.49	6.955	9 10 48.6	44.64	4 14.4
29	21 19 16.29	7.339	17 8 23.2	36.63	4 45.8	29	22 44 55.26	6.943	8 52 55.5	44.80	4 13.2
30	21 22 12.26	7.325	16 53 39.6	37.01	4 44.7	30	22 47 41.75	6.932	8 34 58.5	44.95	4 12.0
31	21 25 7.89	+7.312	−16 38 46.9	+37.38	4 43.7	31	22 50 27.98	+6.921	− 8 16 58.0	+45.09	4 10.8
32	21 28 3.19	+7.298	−16 23 45.4	+37.74	4 42.7	32	22 53 13.94	+6.910	− 7 58 54.1	+45.23	4 9.6

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
	″	″	″	″	″	″
Semidiameter . . .	4.2	4.1	4.0	3.9	3.8	3.7
Hor. Parallax . . .	7.3	7.1	6.9	6.8	6.6	6.5

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	32d.
	″	″	″	″	″	″	″
Semidiameter . .	3.6	3.5	3.5	3.4	3.3	3.2	3.1
Hor. Parallax . .	6.3	6.2	6.0	5.9	5.7	5.6	5.5

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	19 17 53.28	+2.501	−22 26 20.2	+4.41	0 33.4	1	19 48 39.70	+2.422	−21 21 8.7	+5.98	22 59.3
2	19 18 53.33	2.502	22 24 33.6	4.47	0 30.5	2	19 49 37.75	2.416	21 18 44.8	6.02	22 56.3
3	19 19 53.39	2.503	22 22 45.6	4.53	0 27.5	3	19 50 35.64	2.409	21 16 20.0	6.06	22 53.3
4	19 20 53.47	2.503	22 20 56.2	4.59	0 24.6	4	19 51 33.37	2.402	21 13 54.3	6.09	22 50.3
5	19 21 53.56	2.504	22 19 5.3	4.65	0 21.7	5	19 52 30.93	2.395	21 11 27.8	6.12	22 47.4
6	19 22 53.66	+2.504	−22 17 13.0	+4.71	0 18.8	6	19 53 28.32	+2.388	−21 9 0.6	+6.15	22 44.4
7	19 23 53.76	2.504	22 15 19.3	4.77	0 15.8	7	19 54 25.53	2.380	21 6 32.6	6.18	22 41.4
8	19 24 53.86	2.504	22 13 24.3	4.82	0 12.9	8	19 55 22.56	2.372	21 4 3.9	6.21	22 38.4
9	19 25 53.95	2.503	22 11 27.8	4.88	0 10.0	9	19 56 19.39	2.364	21 1 34.5	6.24	22 35.4
10	19 26 54.02	2.503	22 9 30.0	4.94	0 7.1	10	19 57 16.04	2.356	20 59 4.5	6.27	22 32.4
11	19 27 54.07	+2.502	−22 7 30.8	+4.99	0 4.2	11	19 58 12.48	+2.348	−20 56 33.8	+6.30	22 29.4
12	19 28 54.10	2.501	22 5 30.3	5.05	0 1.2 23 58.3	12	19 59 8.73	2.339	20 54 2.4	6.32	22 26.4
13	19 29 54.09	2.500	22 3 28.5	5.11	23 55.3	13	20 0 4.76	2.330	20 51 30.5	6.34	22 23.4
14	19 30 54.05	2.498	22 1 25.4	5.16	23 52.3	14	20 1 0.57	2.321	20 48 58.1	6.36	22 20.4
15	19 31 53.97	2.496	21 59 21.0	5.21	23 49.4	15	20 1 56.16	2.311	20 46 25.1	6.38	22 17.4
16	19 32 53.84	+2.494	−21 57 15.4	+5.26	23 46.4	16	20 2 51.52	+2.301	−20 43 51.6	+6.40	22 14.3
17	19 33 53.65	2.491	21 55 8.5	5.31	23 43.5	17	20 3 46.64	2.291	20 41 17.7	6.42	22 11.3
18	19 34 53.40	2.488	21 53 0.3	5.36	23 40.6	18	20 4 41.52	2.281	20 38 43.5	6.44	22 8.3
19	19 35 53.08	2.485	21 50 50.9	5.41	23 37.7	19	20 5 36.15	2.271	20 36 8.8	6.45	22 5.2
20	19 36 52.69	2.482	21 48 40.3	5.46	23 34.7	20	20 6 30.53	2.260	20 33 33.8	6.47	22 2.2
21	19 37 52.21	+2.479	−21 46 28.6	+5.51	23 31.8	21	20 7 24.64	+2.249	−20 30 58.5	+6.48	21 59.1
22	19 38 51.64	2.475	21 44 15.7	5.56	23 28.8	22	20 8 18.48	2.238	20 28 23.0	6.49	21 56.1
23	19 39 50.98	2.471	21 42 1.7	5.61	23 25.9	23	20 9 12.05	2.226	20 25 47.2	6.50	21 53.0
24	19 40 50.22	2.466	21 39 46.6	5.66	23 22.9	24	20 10 5.33	2.214	20 23 11.2	6.50	21 50.0
25	19 41 49.35	2.461	21 37 30.4	5.70	23 20.0	25	20 10 58.33	2.202	20 20 35.1	6.51	21 46.9
26	19 42 48.37	+2.456	−21 35 13.2	+5.74	23 17.0	26	20 11 51.04	+2.190	−20 17 58.9	+6.51	21 43.9
27	19 43 47.26	2.451	21 32 54.9	5.79	23 14.1	27	20 12 43.46	2.178	20 15 22.6	6.51	21 40.8
28	19 44 46.02	2.446	21 30 35.6	5.83	23 11.1	28	20 13 35.56	2.165	20 12 46.2	6.52	21 37.8
29	19 45 44.65	2.440	21 28 15.3	5.87	23 8.1	29	20 14 27.36	2.152	20 10 9.8	6.52	21 34.7
30	19 46 43.15	2.434	21 25 54.0	5.91	23 5.2	30	20 15 18.86	2.139	20 7 33.5	6.51	21 31.6
31	19 47 41.50	+2.428	−21 23 31.8	+5.95	23 2.2	31	20 16 10.02	+2.125	−20 4 57.3	+6.51	21 28.5
32	19 48 39.70	+2.422	−21 21 8.7	+5.98	22 59.3	32	20 17 0.87	+2.112	−20 2 21.1	+6.50	21 25.5

Day of the Month.	2d.	10th.	18th.	26th.	Day of the Month.	3d.	11th.	19th.	27th.
Polar Semidiameter . .	15.″3	15.″3	15.″4	15.″4	Polar Semidiameter . .	15.″5	15.″6	15.″8	16.″0
Horizontal Parallax . .	1.4	1.4	1.4	1.5	Horizontal Parallax . .	1.5	1.5	1.5	1.5

NOTE.—The sign + indicates north declinations: the sign — indicates south declinations.

GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.	Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	20 14 27.36	+2.153	−20 10 9.8	+6.52	21 34.7	1	20 38 10.83	+1.635	−18 52 54.9	+5.66	19 56.3
2	20 15 18.85	2.139	20 7 33.5	6.51	21 31.6	2	20 38 49.81	1.614	18 50 39.7	5.60	19 53.0
3	20 16 10.02	2.125	20 4 57.3	6.51	21 28.5	3	20 39 28.29	1.593	18 48 25.9	5.54	19 49.7
4	20 17 0.87	2.112	20 2 21.1	6.50	21 25.5	4	20 40 6.28	1.572	18 46 13.6	5.48	19 46.4
5	20 17 51.40	2.098	19 59 45.1	6.50	21 22.4	5	20 40 43.75	1.551	18 44 2.7	5.42	19 43.1
6	20 18 41.59	+2.084	−19 57 9.3	+6.49	21 19.3	6	20 41 20.72	+1.530	−18 41 53.3	+5.36	19 39.8
7	20 19 31.44	2.070	19 54 33.6	6 48	21 16.2	7	20 41 57.16	1.508	18 39 45.5	5.30	19 36.4
8	20 20 20.96	2.056	19 51 58.2	6.47	21 13.1	8	20 42 33.09	1.486	18 37 39.2	5.23	19 33.1
9	20 21 10.13	2.041	19 49 23.2	6.45	21 10.0	9	20 43 8.48	1.464	18 35 34.6	5.16	19 29.8
10	20 21 58.94	2.026	19 46 48.5	6.44	21 6.8	10	20 43 43.34	1.441	18 33 31.7	5.09	19 26.4
11	20 22 47.39	+2.011	−19 44 14.1	+6.43	21 3.7	11	20 44 17.65	+1.418	−18 31 30.5	+5.01	19 23.1
12	20 23 35.48	1.996	19 41 40.1	6.41	21 0.5	12	20 44 51.41	1.395	18 29 31.0	4.94	19 19.7
13	20 24 23.20	1.981	19 39 6.5	6.39	20 57.4	13	20 45 24.62	1.372	18 27 33.4	4.87	19 16 3
14	20 25 10.54	1.965	19 36 33.5	6.37	20 54.2	14	20 45 57.26	1.348	18 25 37.7	4.79	19 12.8
15	20 25 57.50	1.949	19 34 1.0	6.34	20 51.1	15	20 46 29.33	1.324	18 23 43.8	4.71	19 9.4
16	20 26 44.07	+1.932	−19 31 29.1	+6.32	20 47.9	16	20 47 0.82	+1.300	−18 21 51.9	+4.63	19 6.0
17	20 27 30.24	1.915	19 28 57.9	6.29	20 44.7	17	20 47 31.73	1.275	18 20 2.0	4.54	19 2.5
18	20 28 16.01	1.898	19 26 27.3	6.26	20 41.5	18	20 48 2.04	1.250	18 18 14.2	4.45	18 59.1
19	20 29 1.37	1.881	19 23 57.5	6.23	20 38.3	19	20 48 31.76	1.225	18 16 28.5	4.36	18 55.6
20	20 29 46.31	1.864	19 21 28.4	6.20	20 35.1	20	20 49 0.87	1.200	18 14 44.9	4.27	18 52.2
21	20 30 30.83	+1.846	−19 19 0.0	+6.16	20 31.9	21	20 49 29.37	+1.175	−18 13 3.5	+4.18	18 48.7
22	20 31 14.91	1.828	19 16 32.6	6.13	20 28.7	22	20 49 57.26	1.149	18 11 24.4	4.09	18 45.2
23	20 31 58.56	1.810	19 14 6.0	6.09	20 25.5	23	20 50 24.53	1.123	18 9 47.5	3.99	18 41.7
24	20 32 41.77	1.791	19 11 40.4	6.05	20 22.3	24	20 50 51.17	1.097	18 8 12.9	3.89	16 38.2
25	20 33 24.53	1.772	19 9 15.8	6.01	20 19.1	25	20 51 17.18	1.071	18 6 40.7	3.79	18 34.7
26	20 34 6.84	+1.753	−19 6 52.2	+5.97	20 15.9	26	20 51 42.55	+1.044	−18 5 10.9	+3.69	18 31.2
27	20 34 48.68	1.734	19 4 29.8	5.92	20 12.7	27	20 52 7.28	1.017	18 3 43.5	3.59	18 27.7
28	20 35 30.06	1.715	19 2 8.4	5 87	20 9.4	28	20 52 31.36	0.990	18 2 18.5	3.49	18 24.1
29	20 36 10.97	1.695	18 59 48.2	5.82	20 6.1	29	20 52 54.79	0.963	18 0 56.1	3.38	18 20.6
30	20 36 51.40	1.675	18 57 29.1	5.77	20 2.8	30	20 53 17.57	0.936	17 59 36.2	3.28	18 17.0
31	20 37 31.36	+1.655	−18 55 11.4	+5.72	19 59.6	31	20 53 39.68	+0.908	−17 58 18.9	+3.17	18 13.5
32	20 38 10.83	+1.635	−18 52 54.9	+5.66	19 56.3	32	20 54 1.13	+0.880	−17 57 4.2	+3.06	18 9.9

Day of the Month.	7th.	15th.	23d.	31st.
Polar Semidiameter . .	16″.2	16″.5	16″.8	17″.1
Horizontal Parallax . .	1.5	1.6	1.6	1.6

Day of the Month.	8th.	16th.	24th.
Polar Semidiameter	17″.5	17″.9	18″.4
Horizontal Parallax	1.6	1.7	1.7

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The — sign indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

	MAY.						JUNE.				
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	20 53 39.68	+0.908	−17 58 18.9	+3.17	18 13.5	1	20 59 11.46	−0.039	−17 42 27.7	−0.75	16 16.8
2	20 54 1.13	0.880	17 57 4.2	3.06	18 9.9	2	20 59 10.14	0.071	17 42 47.3	0.89	16 12.9
3	20 54 21.91	0.852	17 55 52.1	2.95	18 6.3	3	20 59 8.05	0.103	17 43 10.1	1.02	16 8.9
4	20 54 42.02	0.824	17 54 42.7	2.84	18 2.7	4	20 59 5.20	0.135	17 43 36.2	1.15	16 4.9
5	20 55 1.45	0.795	17 53 36.1	2.72	17 59.1	5	20 59 1.59	0.167	17 44 5.4	1.29	16 0.9
6	20 55 20.19	+0.767	−17 52 32.1	+2.61	17 55.4	6	20 58 57.21	−0.199	−17 44 37.9	−1.42	15 56.9
7	20 55 38.25	0.738	17 51 31.0	2.49	17 51.8	7	20 58 52.06	0.230	17 45 13.5	1.55	15 52.9
8	20 55 55.60	0.709	17 50 32.6	2.37	17 48.3	8	20 58 46.15	0.262	17 45 52.3	1.68	15 48.8
9	20 56 12.26	0.680	17 49 37.0	2.25	17 44.5	9	20 58 39.48	0.294	17 46 34.3	1.81	15 44.8
10	20 56 28.21	0.650	17 48 44.5	2.13	17 40.8	10	20 58 32.05	0.326	17 47 19.4	1.94	15 40.7
11	20 56 43.44	+0.620	−17 47 54.8	+2.01	17 37.1	11	20 58 23.86	−0.358	−17 48 7.6	−2.07	15 36.6
12	20 56 57.96	0.590	17 47 8.1	1.89	17 33.4	12	20 58 14.91	0.389	17 48 58.9	2.20	15 32.5
13	20 57 11.75	0.560	17 46 24.3	1.76	17 29.7	13	20 58 5.20	0.420	17 49 53.3	2.33	15 28.4
14	20 57 24.82	0.529	17 45 43.5	1.63	17 26.0	14	20 57 54.75	0.451	17 50 50.8	2.46	15 24.3
15	20 57 37.14	0.499	17 45 5.8	1.51	17 22.2	15	20 57 43.56	0.482	17 51 51.2	2.59	15 20.2
16	20 57 48.73	+0.468	−17 44 31.1	+1.38	17 18.5	16	20 57 31.62	−0.513	−17 52 54.7	−2.71	15 16.1
17	20 57 59.58	0.437	17 43 59.6	1.25	17 14.7	17	20 57 18.94	0.543	17 54 1.1	2.83	15 11.9
18	20 58 9.69	0.406	17 43 31.1	1.12	17 10.9	18	20 57 5.55	0.573	17 55 10.3	2.95	15 7.8
19	20 58 19.04	0.375	17 43 5.8	0.99	17 7.2	19	20 56 51.43	0.603	17 56 22.5	3.06	15 3.6
20	20 58 27.63	0.343	17 42 43.6	0 86	17 3.4	20	20 56 36.61	0.632	17 57 37.4	3.18	14 59.4
21	20 58 35.48	+0.312	−17 42 24.6	+0.73	16 59.6	21	20 56 21.08	−0.661	−17 58 55.1	−3.29	14 55.2
22	20 58 42.57	0.280	17 42 8.8	0.60	16 55.7	22	20 56 4.86	0.690	18 0 15.5	3.40	14 51.0
23	20 58 48.89	0.248	17 41 56.2	0.46	16 51.9	23	20 55 47.96	0.718	18 1 38.6	3.51	14 46.8
24	20 58 54.46	0.216	17 41 46.8	0.33	16 48.1	24	20 55 30.38	0.746	18 3 4.2	3.62	14 42 5
25	20 58 59.26	0.184	17 41 40.6	0.20	16 44.2	25	20 55 12.14	0.774	18 4 32.4	3.73	14 38.3
26	20 59 3.30	+0.152	−17 41 37.6	+0.06	16 40.3	26	20 54 53.25	−0.801	−18 6 3.0	−3.83	14 34.1
27	20 59 6.57	0.120	17 41 37.9	−0.07	16 36.4	27	20 54 33.72	0.827	18 7 36.1	3.93	14 29.8
28	20 59 9.08	0.089	17 41 41.4	0.21	16 32.5	28	20 54 13.56	0.853	18 9 11.5	4.02	14 25.5
29	20 59 10.82	0.057	17 41 48.1	0.35	16 28.6	29	20 53 52.79	0.878	18 10 49.1	4.11	14 21.2
30	20 59 11.80	+0.025	17 41 58.1	0.48	16 24.7	30	20 53 31.41	0.903	18 12 29.0	4.20	14 17.0
31	20 59 12.01	−0.007	−17 42 11.3	−0.62	16 20.8	31	20 53 9.44	−0.928	−18 14 11.0	−4.29	14 12.6
32	20 59 11.46	−0.039	−17 42 27.7	−0.75	16 16.8	32	20 52 46.88	−0.952	−18 15 55.0	−4.38	14 8.3

Day of the Month.	2d.	10th.	18th.	26th.	Day of the Month.	3d.	11th.	19th.	27th.
Polar Semidiameter . .	18.″8	19.″3	19.″8	20.″3	Polar Semidiameter . .	20.″8	21.″3	21.″8	22.″2
Horizontal Parallax . .	1.8	1.8	1.9	1.9	Horizontal Parallax . .	2.0	2.0	2.1	2.1

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	20 53 9.44	−0.928	−18 14 11.0	−4.29	14 12.6	1	20 38 21.67	−1.323	−19 17 3.9	−5.23	11 55.9
2	20 52 46.88	0.952	18 15 55.0	4.38	14 8.3	2	20 37 49.91	1.322	19 19 9.3	5.20	11 51.5
3	20 52 23.75	0.975	18 17 41.0	4.46	14 4.0	3	20 37 18.19	1.320	19 21 13.9	5.17	11 47.0
4	20 52 0.07	0.998	18 19 28.9	4.54	13 59.7	4	20 36 46.55	1.317	19 23 17.6	5.13	11 42.5
5	20 51 35.85	1.020	18 21 18.6	4.61	13 55.4	5	20 36 15.00	1.313	19 25 20.3	5.09	11 38.1
6	20 51 11.10	−1.042	−18 23 10.2	−4.68	13 51.0	6	20 35 43.56	−1.307	−19 27 22.1	−5.05	11 33.6
7	20 50 45.83	1.063	18 25 3.5	4.75	13 46.7	7	20 35 12.26	1.301	19 29 22.7	5.00	11 29.2
8	20 50 20.07	1.083	18 26 58.4	4.82	13 42.3	8	20 34 41.11	1.294	19 31 22.2	4.95	11 24.7
9	20 49 53.83	1.103	18 28 54.8	4.88	13 37.9	9	20 34 10.15	1.286	19 33 20.5	4.90	11 20.3
10	20 49 27.11	1.122	18 30 52.7	4.94	13 33.5	10	20 33 39.40	1.277	19 35 17.4	4.84	11 15.9
11	20 48 59.95	−1.140	−18 32 51.9	−4.99	13 29.2	11	20 33 8.88	−1.267	−19 37 12.9	−4.78	11 11.4
12	20 48 32.35	1.158	18 34 52.4	5.04	13 24.8	12	20 32 38.60	1.256	19 39 6.9	4.72	11 7.0
13	20 48 4.34	1.175	18 36 54.0	5.09	13 20.4	13	20 32 8.60	1.244	19 40 59.4	4.65	11 2.6
14	20 47 35.93	1.192	18 38 56.8	5.13	13 16.0	14	20 31 38.90	1.231	19 42 50.3	4.58	10 58.2
15	20 47 7.14	1.207	18 41 0.6	5.17	13 11.5	15	20 31 9.53	1.217	19 44 39.4	4.51	10 53.7
16	20 46 38.01	−1.221	−18 43 5.2	−5.21	13 7.1	16	20 30 40.50	−1.202	−19 46 26.8	−4.44	10 49.3
17	20 46 8.54	1.235	18 45 10.7	5.24	13 2.7	17	20 30 11.83	1.186	19 48 12.4	4.36	10 44.9
18	20 45 38.76	1.248	18 47 16.9	5.27	12 58.3	18	20 29 43.55	1.170	19 49 56.1	4.28	10 40.5
19	20 45 8.69	1.259	18 49 23.7	5.29	12 53.8	19	20 29 15.69	1.152	19 51 37.8	4.20	10 36.1
20	20 44 38.35	1.269	18 51 31.1	5.31	12 49.4	20	20 28 48.26	1.134	19 53 17.5	4.12	10 31.8
21	20 44 7.76	−1.279	−18 53 38.8	−5.33	12 45.0	21	20 28 21.27	−1.115	−19 54 55.2	−4.03	10 27.4
22	20 43 36.96	1.288	18 55 46.8	5.34	12 40.5	22	20 27 54.75	1.094	19 56 30.8	3.94	10 23.0
23	20 43 5.95	1.295	18 57 55.1	5.34	12 36.1	23	20 27 28.73	1.073	19 58 4.1	3.85	10 18.7
24	20 42 34.77	1.302	19 0 3.5	5.35	12 31.6	24	20 27 3.21	1.052	19 59 35.3	3.75	10 14.3
25	20 42 3.43	1.308	19 2 12.0	5.35	12 27.2	25	20 26 38.21	1.030	20 1 4.3	3.66	10 10.0
26	20 41 31.97	−1.313	−19 4 20.3	−5.34	12 22.7	26	20 26 13.74	−1.007	−20 2 30.9	−3.56	10 5.6
27	20 41 0.39	1.317	19 6 28.5	5.33	12 18.3	27	20 25 49.84	0.984	20 3 55.2	3.46	10 1.3
28	20 40 28.73	1.320	19 8 36.4	5.32	12 13.8	28	20 25 26.50	0.960	20 5 17.2	3.36	9 57.0
29	20 39 57.00	1.322	19 10 44.1	5.30	12 9.3	29	20 25 3.75	0.935	20 6 36.7	3.26	9 52.7
30	20 39 25.24	1.323	19 12 51.2	5.28	12 4.9	30	20 24 41.60	0.910	20 7 53.9	3.16	9 48.4
31	20 38 53.45	−1.324	−19 14 57.9	−5.26	12 0.4	31	20 24 20.06	−0.884	−20 9 8.5	−3.06	9 44.1
32	20 38 21.67	−1.323	−19 17 3.9	−5.23	11 55.9	32	20 23 59.14	−0.858	−20 10 20.7	−2.96	9 39.9

Day of the Month.	5th.	13th.	21st.	29th.	Day of the Month.	6th.	14th.	22d.	30th.
Polar Semidiameter . .	22.″6	22.″9	23.″0	23.″1	Polar Semidiameter . .	23.″1	22.″9	22.″7	22.″4
Horizontal Parallax . .	2.1	2.1	2.2	2.2	Horizontal Parallax . .	2.2	2.2	2.1	2.1

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	20 23 59.14	−0.858	−20 10 20.7	−2.96	9 39.9
2	20 23 38.86	0.831	20 11 30.4	2.85	9 35.6
3	20 23 19.23	0.804	20 12 37.6	2.75	9 31.3
4	20 23 0.27	0.776	20 13 42.2	2.64	9 27.1
5	20 22 41.99	0.748	20 14 44.2	2.53	9 22.9
6	20 22 24.39	−0.719	−20 15 43.6	−2.42	9 18.7
7	20 22 7.49	0.689	20 16 40.4	2.31	9 14.5
8	20 21 51.30	0.659	20 17 34.5	2.20	9 10.3
9	20 21 35.84	0.629	20 18 26.0	2.09	9 6.1
10	20 21 21.10	0.598	20 19 14.8	1.98	9 1.9
11	20 21 7.11	−0.567	−20 20 0.9	−1.86	8 57.7
12	20 20 53.90	0.535	20 20 44.3	1.75	8 53.6
13	20 20 41.44	0.503	20 21 25.0	1.64	8 49.5
14	20 20 29.75	0.471	20 22 2.9	1.52	8 45.3
15	20 20 18.83	0.438	20 22 38.1	1.41	8 41.2
16	20 20 8.71	−0.405	−20 23 10.5	−1.30	8 37.1
17	20 19 59.37	0.372	20 23 40.1	1.18	8 33.1
18	20 19 50.83	0.339	20 24 7.0	1.07	8 29.0
19	20 19 43.09	0.306	20 24 31.1	0.95	8 24.9
20	20 19 36.16	0.272	20 24 52.5	0.83	8 20.9
21	20 19 30.04	−0.239	−20 25 11.0	−0.71	8 16.9
22	20 19 24.73	0.205	20 25 26.8	0.59	8 12.9
23	20 19 20.24	0.171	20 25 39.8	0.48	8 8.9
24	20 19 16.56	0.137	20 25 50.0	· 0.36	8 4.9
25	20 19 13.70	0.102	20 25 57.4	0.25	8 0.9
26	20 19 11.65	−0.068	−20 26 2.1	−0.14	7 56.9
27	20 19 10.42	−0.034	20 26 4.0	−0.02	7 53.0
28	20 19 10.00	0.000	20 26 3.1	+0.10	7 49.0
29	20 19 10.41	+0.034	20 25 59.5	0.21	7 45.1
30	20 19 11.62	0.068	20 25 53.2	0.33	7 41.2
31	20 19 13.66	+0.102	−20 25 44.0	+0.44	7 37.3
32	20 19 16.51	+0.136	−20 25 32.2	+0.55	7 33.4

Day of the Month.	7th.	15th.	23d.
Polar Semidiameter	22″.0	21″.6	21″.1
Horizontal Parallax	2.1	2.0	2.0

OCTOBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	20 19 13.66	+0.102	−20 25 44.0	+0.44	7 37.3
2	20 19 16.51	0.136	20 25 32.2	0.55	7 33.4
3	20 19 20.17	0.170	20 25 17.6	0.67	7 29.6
4	20 19 24.65	0.204	20 25 0.3	0.78	7 25.7
5	20 19 29.94	0.237	20 24 40.2	0.89	7 21.9
6	20 19 36.04	+0.271	−20 24 17.4	+1.01	7 18.1
7	20 19 42.95	0.305	20 23 51.9	1.12	7 14.2
8	20 19 50.66	0.338	20 23 23.6	1.23	7 10.4
9	20 19 59.19	0.372	20 22 52.7	1.35	7 6.6
10	20 20 8.52	0.406	20 22 19.0	1.46	7 2.9
11	20 20 18.66	+0.439	−20 21 42.6	+1.57	6 59.1
12	20 20 29.59	0.472	20 21 3.6	1.69	6 55.4
13	20 20 41.32	0.505	20 20 21.8	1.80	6 51.6
14	20 20 53.83	0.538	20 19 37.3	1.91	6 47.9
15	20 21 7.14	0.571	20 18 50.2	2.03	6 44.2
16	20 21 21.23	+0.603	−20 18 0.3	+2.14	6 40.5
17	20 21 36.09	0.635	20 17 7.8	2.25	6 36.8
18	20 21 51.72	0.667	20 16 12.6	2.36	6 33.2
19	20 22 8.12	0.699	20 15 14.7	2.47	6 29.5
20	20 22 25.26	0.730	20 14 14.2	2.58	6 25.9
21	20 22 43.18	+0.761	−20 13 11.1	+2.69	6 22.2
22	20 23 1.83	0.792	20 12 5.3	2.80	6 18.6
23	20 23 21.22	0.823	20 10 56.9	2.91	6 15.0
24	20 23 41.34	0.853	20 9 45.8	3.02	6 11.4
25	20 24 2.19	0.883	20 8 32.2	3.13	6 7.8
26	20 24 23.75	+0.913	−20 7 15.9	+3.23	6 4.3
27	20 24 46.01	0.942	20 5 57.1	3.34	6 0.7
28	20 25 8.98	0.971	20 4 35.8	3.45	5 57.1
29	20 25 32.64	1.000	20 3 11.8	3.55	5 53.6
30	20 25 56.99	1.029	20 1 45.3	3.66	5 50.1
31	20 26 22.02	+1.057	−20 0 16.2	+3.77	5 46.6
32	20 26 47.73	+1.085	−19 58 44.6	+3.87	5 43.1

Day of the Month.	1st.	9th.	17th.	25th.
Polar Semidiameter . .	20″.6	20″.1	19″.6	19″.1
Horizontal Parallax . .	1.9	1.9	1.8	1.8

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	20 26 47.73	+1.085	−19 58 44.6	+3.87	5 43.1
2	20 27 14.10	1.113	19 57 10.5	3.98	5 39.6
3	20 27 41.13	1.140	19 55 33.8	4.09	5 36.1
4	20 28 8.82	1.167	19 53 54.5	4.19	5 32.7
5	20 28 37.16	1.194	19 52 12.8	4.30	5 29.2
6	20 29 6.14	+1.221	−19 50 28.5	+4.40	5 25.8
7	20 29 35.76	1.247	19 48 41.7	4.50	5 22.3
8	20 30 6.00	1.273	19 46 52.4	4.61	5 18.9
9	20 30 36.87	1.299	19 45 0.7	4.71	5 15.4
10	20 31 8.34	1.324	19 43 6.4	4.81	5 12.0
11	20 31 40.43	+1.349	−19 41 9.6	+4.92	5 8.6
12	20 32 13.12	1.374	19 39 10.4	5.02	5 5.2
13	20 32 46.39	1.399	19 37 8.6	5.12	5 1.8
14	20 33 20.25	1.423	19 35 4.4	5.23	4 58.5
15	20 33 54.68	1.447	19 32 57.7	5.33	4 55.1
16	20 34 29.68	+1.470	−19 30 48.5	+5.43	4 51.7
17	20 35 5.23	1.493	19 28 37.0	5.53	4 48.4
18	20 35 41.32	1.516	19 26 23.0	5.63	4 45.1
19	20 36 17.96	1.538	19 24 6.6	5.73	4 41.8
20	20 36 55.13	1.560	19 21 47.8	5.83	4 38.5
21	20 37 32.81	+1.581	−19 19 26.6	+5.93	4 35.2
22	20 38 11.01	1.602	19 17 3.0	6.03	4 31.9
23	20 38 49.71	1.623	19 14 37.0	6.13	4 28.6
24	20 39 28.90	1.643	19 12 8.7	6.23	4 25.3
25	20 40 8.58	1.663	19 9 38.0	6.33	4 22.0
26	20 40 48.74	+1.683	−19 7 5.0	+6.43	4 18.8
27	20 41 29.37	1.703	19 4 29.7	6.53	4 15.5
28	20 42 10.46	1.722	19 1 52.1	6.62	4 12.3
29	20 42 52.01	1.741	18 59 12.2	6.72	4 9.0
30	20 43 34.01	1.759	18 56 29.9	6.81	4 5.8
31	20 44 16.45	+1.777	−18 53 45.4	+6.90	4 2.5
32	20 44 59.33	+1.795	−18 50 58.6	+7.00	3 59.3

DECEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	20 44 16.45	+1.777	−18 53 45.4	+6.90	4 2.5
2	20 44 59.33	1.795	18 50 58.6	7.00	3 59.3
3	20 45 42.63	1.813	18 48 9.5	7.10	3 56.1
4	20 46 26.35	1.831	18 45 18.2	7.19	3 52.9
5	20 47 10.49	1.848	18 42 24.6	7.29	3 49.7
6	20 47 55.04	+1.865	−18 39 28.8	+7.38	3 46.5
7	20 48 39.99	1.881	18 36 30.7	7.47	3 43.3
8	20 49 25.33	1.897	18 33 30.4	7.56	3 40.2
9	20 50 11.06	1.913	18 30 27.9	7.65	3 37.0
10	20 50 57.17	1.929	18 27 23.2	7.74	3 33.8
11	20 51 43.64	+1.944	−18 24 16.3	+7.83	3 30.6
12	20 52 30.47	1.959	18 21 7.2	7.92	3 27.5
13	20 53 17.66	1.973	18 17 56.0	8.01	3 24.3
14	20 54 5.19	1.987	18 14 42.6	8.10	3 21.2
15	20 54 53.06	2.001	18 11 27.2	8.19	3 18.0
16	20 55 41.26	+2.015	−18 8 9.5	+8.28	3 14.9
17	20 56 29.78	2.028	18 4 49.8	8.37	3 11.8
18	20 57 18.62	2.041	18 1 28.0	8.45	3 8.7
19	20 58 7.75	2.054	17 58 4.2	8.53	3 5.6
20	20 58 57.19	2.066	17 54 38.3	8.62	3 2.5
21	20 59 46.91	+2 078	−17 51 10.4	+8.70	2 59.4
22	21 0 36.91	2.089	17 47 40.6	8.78	2 56.3
23	21 1 27.19	2.100	17 44 8.7	8.87	2 53.2
24	21 2 17.73	2.111	17 40 34.9	8.95	2 50.1
25	21 3 8.54	2.122	17 36 59.2	9.03	2 47.0
26	21 3 59.60	+2.133	−17 33 21.5	+9.11	2 43.9
27	21 4 50.91	2.143	17 29 41.9	9.19	2 40.8
28	21 5 42.47	2.153	17 26 0.4	9.27	2 37.7
29	21 6 34.26	2.163	17 22 17.0	9.35	2 34.6
30	21 7 26.28	2.172	17 18 31.7	9.43	2 31.6
31	21 8 18.52	+2.181	−17 14 44.6	+9.50	2 28.5
32	21 9 10.98	+2.190	−17 10 55.7	+9.58	2 25.5

Day of the Month.	2d.	10th.	18th.	26th.
Polar Semidiameter . .	18″.6	18″.2	17″.8	17″.4
Horizontal Parallax . .	1.7	1.7	1.7	1.6

Day of the Month.	4th.	12th.	20th.	28th.	36th.
Polar Semidiameter . .	17″.0	16″.7	16″.5	16″.3	16″.1
Horizontal Parallax . .	1.6	1.6	1.5	1.5	1.5

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	10 24 26.46	−0.298	+11 39 17.7	+2.32	15 37.5
2	10 24 19.11	0.314	11 40 14.6	2.41	15 33.4
3	10 24 11.36	0.330	11 41 13.5	2.50	15 29.3
4	10 24 3.23	0.346	11 42 14.6	2.59	15 25.3
5	10 23 54.73	0.362	11 43 17.7	2.68	15 21.2
6	10 23 45.85	−0.378	+11 44 22.8	+2.76	15 17.1
7	10 23 36.59	0.393	11 45 30.0	2.84	15 13.0
8	10 23 26.97	0.408	11 46 39.1	2.92	15 8.9
9	10 23 16.98	0.423	11 47 50.1	3.00	15 4.8
10	10 23 6.64	0.438	11 49 3.1	3.08	15 0.7
11	10 22 55.93	−0.453	+11 50 17.9	+3.16	14 56.6
12	10 22 44.87	0.468	11 51 34.5	3.24	14 52.5
13	10 22 33.48	0.482	11 52 53.0	3.31	14 48.4
14	10 22 21.74	0.496	11 54 13.2	3.38	14 44.2
15	10 22 9.67	0.510	11 55 35.1	3.45	14 40.1
16	10 21 57.28	−0.523	+11 56 58.7	+3.52	14 35.9
17	10 21 44.56	0.536	11 58 24.0	3.59	14 31.8
18	10 21 31.53	0.549	11 59 50.8	3.65	14 27.7
19	10 21 18.18	0.562	12 1 19.1	3.71	14 23.5
20	10 21 4.54	0.575	12 2 48.9	3.77	14 19.3
21	10 20 50.61	−0.587	+12 4 20.2	+3.83	14 15.2
22	10 20 36.40	0.599	12 5 52.9	3.89	14 11.0
23	10 20 21.90	0.610	12 7 26.9	3.95	14 6.8
24	10 20 7.14	0.621	12 9 2.2	4.00	14 2.6
25	10 19 52.12	0.632	12 10 38.7	4.05	13 58.5
26	10 19 36.85	−0.642	+12 12 16.4	+4.10	13 54.3
27	10 19 21.33	0.652	12 13 55.2	4.14	13 50.1
28	10 19 5.58	0.661	12 15 35.0	4.18	13 45.9
29	10 18 49.61	0.670	12 17 15.8	4.22	13 41.7
30	10 18 33.43	0.679	12 18 57.6	4.26	13 37.5
31	10 18 17.05	−0.687	+12 20 40.2	+4.29	13 33.3
32	10 18 0.47	−0.695	+12 22 23.7	+4.32	13 29.1

Day of the Month.	2d.	10th.	18th.	26th.
	″	″	″	″
Polar Semidiameter . .	9.1	9.2	9.3	9.4
Horizontal Parallax . .	1.0	1.0	1.1	1.1

FEBRUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	10 18 0.47	−0.695	+12 22 23.7	+4.32	13 29.1
2	10 17 43.70	0.703	12 24 7.9	4.35	13 24.9
3	10 17 26.75	0.710	12 25 52.8	4.38	13 20.7
4	10 17 9.64	0.717	12 27 38.3	4.41	13 16.4
5	10 16 52.36	0.723	12 29 24.4	4.43	13 12.2
6	10 16 34.93	−0.729	+12 31 11.1	+4.45	13 8.0
7	10 16 17.35	0.735	12 32 58.3	4.47	13 3.8
8	10 15 59.65	0.740	12 34 45.9	4.49	12 59.5
9	10 15 41.82	0.745	12 36 33.9	4.50	12 55.3
10	10 15 23.88	0.749	12 38 22.1	4.51	12 51.1
11	10 15 5.84	−0.753	+12 40 10.6	+4.52	12 46.9
12	10 14 47.70	0.757	12 41 59.3	4.53	12 42.6
13	10 14 29.48	0.761	12 43 48.1	4.54	12 38.4
14	10 14 11.19	0.764	12 45 37.0	4.54	12 34.1
15	10 13 52.84	0.766	12 47 25.9	4.53	12 29.9
16	10 13 34.44	−0.768	+12 49 14.7	+4.53	12 25.7
17	10 13 15.99	0.769	12 51 3.4	4.52	12 21.4
18	10 12 57.52	0.770	12 52 51.9	4.52	12 17.2
19	10 12 39.03	0.770	12 54 40.2	4.51	12 13.0
20	10 12 20.53	0.770	12 56 28.2	4.49	12 8.7
21	10 12 2.03	−0.770	+12 58 15.8	+4.47	12 4.5
22	10 11 43.56	0.769	13 0 2.9	4.45	12 0.2
23	10 11 25.11	0.768	13 1 49.6	4.43	11 56.0
24	10 11 6.70	0.767	13 3 35.7	4.41	11 51.8
25	10 10 48.34	0.765	13 5 21.1	4.38	11 47.5
26	10 10 30.03	−0.762	+13 7 6.0	+4.35	11 43.3
27	10 10 11.79	0.759	13 8 50.2	4.32	11 39.1
28	10 9 53.64	0 755	13 10 33.5	4.29	11 34.8
29	10 9 35.57	0.751	13 12 15.9	4.25	11 30.6
30	10 9 17.61	0.747	13 13 57.5	4.21	11 26.4
31	10 8 59.75	−0.742	+13 15 38.2	+4.17	11 22.1
32	10 8 42.01	−0.737	+13 17 17.9	+4.13	11 17.9

Day of the Month.	3d.	11th.	19th.	27th.
	″	″	″	″
Polar Semidiameter . .	9.4	9.4	9.5	9.4
Horizontal Parallax . .	1.1	1.1	1.1	1.1

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	10 9 35.57	−0.751	+13 12 15.9	+4.25	11 30.6	1	10 1 49.52	−0.448	+13 54 9.9	+2.26	9 21.0
2	10 9 17.61	0.747	13 13 57.5	4.21	11 26.4	2	10 1 38.95	0.434	13 55 2.9	2.17	9 16.9
3	10 8 59.75	0.742	13 15 38.2	4.17	11 22.1	3	10 1 28.73	0.419	13 55 53.9	2.08	9 12.8
4	10 8 42.01	0.737	13 17 17.9	4.13	11 17.9	4	10 1 18.85	0.404	13 56 42.7	1.99	9 8.7
5	10 8 24.40	0.731	13 18 56.5	4.09	11 13.7	5	10 1 9.33	0.389	13 57 29.4	1.91	9 4.7
6	10 8 6.92	−0.725	+13 20 34.1	+4.04	11 9.5	6	10 0 0.19	−0.374	+13 58 14.0	+1.82	9 0.6
7	10 7 49.60	0.719	13 22 10.5	3.99	11 5.2	7	10 0 51.40	0.359	13 58 56.6	1.73	8 56.5
8	10 7 32.43	0.712	13 23 45.7	3.94	11 1.0	8	10 0 42.98	0.343	13 59 37.0	1.64	8 52.4
9	10 7 15.42	0.705	13 25 19.7	3.89	10 56.8	9	10 0 34.93	0.327	14 0 15.2	1.55	8 48.4
10	10 6 58.58	0.698	13 26 52.5	3.84	10 52.6	10	10 0 27.26	0.311	14 0 51.3	1.46	8 44.3
11	10 6 41.93	−0.690	+13 28 23.9	+3.78	10 48.4	11	10 0 19.97	−0.295	+14 1 25.2	+1.37	8 40.3
12	10 6 25.47	0.682	13 29 54.0	3.72	10 44.2	12	10 0 13.06	0.279	14 1 57.0	1.28	8 36.2
13	10 6 9.21	0.673	13 31 22.7	3.66	10 40.0	13	10 0 6.54	0.263	14 2 26.5	1.19	8 32.2
14	10 5 53.16	0.664	13 32 49.9	3.60	10 35.8	14	10 0 0.41	0.247	14 2 53.8	1.09	8 28.2
15	10 5 37.33	0.655	13 34 15.7	3.54	10 31.6	15	9 59 54.66	0.231	14 3 19.0	1.00	8 24.1
16	10 5 21.73	−0.645	+13 35 39.9	+3.48	10 27.4	16	9 59 49.35	−0.215	+14 3 41.8	+0.91	8 20.1
17	10 5 6.37	0.635	13 37 2.5	3.41	10 23.2	17	9 59 44.41	0.198	14 4 2.4	0.82	8 16.1
18	10 4 51.24	0.625	13 38 23.6	3.34	10 19.1	18	9 59 39.87	0.181	14 4 20.8	0.73	8 12.1
19	10 4 36.37	0.614	13 39 43.0	3.27	10 14.9	19	9 59 35.74	0.164	14 4 37.0	0.63	8 8.1
20	10 4 21.76	0.603	13 41 0.7	3.20	10 10.7	20	9 59 32.01	0.147	14 4 51.0	0.54	8 4.1
21	10 4 7.42	−0.591	+13 42 16.7	+3.13	10 6.5	21	9 59 28.70	−0.130	+14 5 2.6	+0.45	8 0.1
22	10 3 53.36	0.579	13 43 31.0	3.06	10 2.4	22	9 59 25.79	0.113	14 5 12.0	0.35	7 56.1
23	10 3 39.58	0.567	13 44 43.4	2.99	9 58.2	23	9 59 23.30	0.096	14 5 19.2	0.26	7 52.2
24	10 3 26.09	0.555	13 45 54.0	2.91	9 54.1	24	9 59 21.21	0.078	14 5 24.1	0.16	7 48.2
25	10 3 12.91	0.543	13 47 2.8	2.83	9 49.9	25	9 59 19.53	0.061	14 5 26.7	+0.07	7 44.2
26	10 3 0.03	−0.530	+13 48 9.7	+2.75	9 45.8	26	9 59 18.28	−0.043	+14 5 27.0	−0.03	7 40.3
27	10 2 47.47	0.517	13 49 14.6	2.67	9 41.6	27	9 59 17.43	0.026	14 5 25.1	0.12	7 36.4
28	10 2 35.22	0.504	13 50 17.6	2.59	9 37.5	28	9 59 16.99	−0.009	14 5 21.0	0.22	7 32.4
29	10 2 23.30	0.490	13 51 18.7	2.51	9 33.4	29	9 59 16.97	+0.008	14 5 14.6	0.31	7 28.5
30	10 2 11.70	0.476	13 52 17.8	2.42	9 29.3	30	9 59 17.35	0.025	14 5 6.0	0.41	7 24.6
31	10 2 0.44	−0.462	+13 53 14.8	+2.34	9 25.1	31	9 59 18.15	+0.042	+14 4 55.2	−0.50	7 20.6
32	10 1 49.52	−0.448	+13 54 9.9	+2.26	9 21.0	32	9 59 19.35	+0.059	+14 4 42.1	−0.59	7 16.7

Day of the Month.	7th.	15th.	23d.	31st.	Day of the Month.	8th.	16th.	24th.
Polar Semidiameter . .	9″.4	9″.4	9″.3	9″.2	Polar Semidiameter	9″.1	9″.0	8″.8
Horizontal Parallax . .	1.1	1.1	1.1	1.0	Horizontal Parallax	1.0	1.0	1.0

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign − indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	9 59 18.15	+0.042	+14 4 55.2	−0.50	7 20.6
2	9 59 19.35	0.059	14 4 42.1	0.59	7 16.7
3	9 59 20.97	0.076	14 4 26.8	0.69	7 12.8
4	9 59 22.99	0.093	14 4 9.3	0.78	7 8.9
5	9 59 25.42	0.110	14 3 49.7	0.87	7 5.1
6	9 59 28.26	+0.127	+14 3 27.6	−0.96	7 1.2
7	9 59 31.50	0.144	14 3 3.7	1.05	6 57.3
8	9 59 35.14	0.161	14 2 37.5	1.14	6 53.4
9	9 59 39.19	0.177	14 2 9.1	1.23	6 49.5
10	9 59 43.64	0.194	14 1 38.5	1.32	6 45.7
11	9 59 48.50	+0.211	+14 1 5.7	−1.41	6 41.8
12	9 59 53 75	0.228	14 0 30.8	1.50	6 38.0
13	9 59 59.40	0.244	13 59 53.8	1.59	6 34.2
14	10 0 5.45	0.260	13 59 14.7	1.67	6 30.3
15	10 0 11.90	0.277	13 58 33.4	1.76	6 26.5
16	10 0 18.75	+0.293	+13 57 50.1	−1.85	6 22.7
17	10 0 25.98	0.310	13 57 4.6	1.94	6 18.9
18	10 0 33.61	0.326	13 56 17.1	2.03	6 15.1
19	10 0 41.63	0.342	13 55 27.4	2.11	6 11.3
20	10 0 50.03	0.358	13 54 35.7	2.20	6 7.5
21	10 0 58.81	+0.374	+13 53 42.0	−2.29	6 3.7
22	10 1 7.98	0.390	13 52 46.2	2.37	5 59.9
23	10 1 17.53	0.406	13 51 48.4	2.45	5 56.1
24	10 1 27.45	0.421	13 50 48.5	2.53	5 52.4
25	10 1 37.74	0.437	13 49 46.7	2.62	5 48.6
26	10 1 48.42	+0.452	+13 48 42.9	−2.70	5 44.9
27	10 1 59.45	0.467	13 47 37.2	2.78	5 41.1
28	10 2 10.84	0.482	13 46 29.5	2.86	5 37.4
29	10 2 22.59	0.497	13 45 19.9	2.94	5 33.6
30	10 2 34.70	0.512	13 44 8.3	3.02	5 29.9
31	10 2 47.16	+0.527	+13 42 54.9	−3.10	5 26.2
32	10 2 59.96	+0.541	+13 41 39.6	−3.18	5 22.5

Day of the Month.	2d.	10th.	18th.	26th.
Polar Semidiameter . .	8.″7	8.″6	8.″5	8.″4
Horizontal Parallax . .	1.0	1.0	1.0	0.9

JUNE.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	10 2 59.96	+0.541	+13 41 39.6	−3.18	5 22.5
2	10 3 13.11	0.555	13 40 22.4	3.26	5 18.8
3	10 3 26.61	0.569	13 39 3.4	3.33	5 15.1
4	10 3 40.45	0.583	13 37 42.6	3.41	5 11.4
5	10 3 54.61	0.597	13 36 20.0	3.49	5 7.7
6	10 4 9.11	+0.611	+13 34 55.6	−3.56	5 4.0
7	10 4 23.94	0.625	13 33 29.4	3.63	5 0.3
8	10 4 39.09	0.638	13 32 1.5	3.70	4 56.6
9	10 4 54.56	0.652	13 30 31.8	3.78	4 52.9
10	10 5 10.37	0.665	13 29 0.3	3.85	4 49.2
11	10 5 26.48	+0.678	+13 27 27.1	−3.92	4 45.6
12	10 5 42.91	0.691	13 25 52.2	3.99	4 41.9
13	10 5 59.65	0.704	13 24 15.7	4.06	4 38.3
14	10 6 16.69	0.717	13 22 37.5	4.13	4 34.6
15	10 6 34.04	0.730	13 20 57.6	4.20	4 31.0
16	10 6 51.69	+0.742	+13 19 16.1	−4.27	4 27.3
17	10 7 9.64	0.754	13 17 33.0	4.34	4 23.7
18	10 7 27.87	0.766	13 15 48.3	4.40	4 20.1
19	10 7 46.40	0.778	13 14 1.9	4.47	4 16.5
20	10 8 5.21	0.790	13 12 14.0	4.54	4 12.9
21	10 8 24.29	+0.801	+13 10 24.6	−4.60	4 9.3
22	10 8 43.65	0.812	13 8 33.7	4.66	4 5.7
23	10 9 3.30	0.823	13 6 41.2	4.72	4 2.1
24	10 9 23.20	0.834	13 4 47.3	4.78	3 58.5
25	10 9 43.36	0.845	13 2 52.0	4.84	3 54.9
26	10 10 3.77	+0.856	+13 0 55.1	−4.90	3 51.3
27	10 10 24.45	0.867	12 58 56.9	4.96	3 47.7
28	10 10 45.37	0.877	12 56 57.3	5.01	3 44.1
29	10 11 6.53	0.887	12 54 56.3	5.07	3 40.5
30	10 11 27.94	0.897	12 52 53.9	5.13	3 36.9
31	10 11 49.59	+0.907	+12 50 50.2	−5.19	3 33.3
32	10 12 11.47	+0.917	+12 48 45.0	−5.24	3 29.7

Day of the Month.	3d.	11th.	19th.	27th.
Polar Semidiameter . .	8.″2	8.″1	8.″0	7.″9
Horizontal Parallax . .	0.9	0.9	0.9	0.9

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

	JULY.						AUGUST.				
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	10 11 49.59	+0.907	+12 50 50.2	−5.19	3 33.3	1	10 24 37.35	+1.130	+11 37 35.4	−6.49	1 44.2
2	10 12 11.47	0.917	12 48 45.1	5.24	3 29.7	2	10 25 4.52	1.134	11 34 59.2	6.52	1 40.7
3	10 12 33.57	0.926	12 46 38.8	5.29	3 26.2	3	10 25 31.80	1.139	11 32 22.3	6.55	1 37.3
4	10 12 55.90	0.935	12 44 31.2	5.35	3 22.6	4	10 25 59.19	1.143	11 29 44.9	6.58	1 33.8
5	10 13 18.45	0.944	12 42 22.4	5.40	3 19.1	5	10 26 26.67	1.147	11 27 6.8	6.61	1 30.3
6	10 13 41.23	+0.953	+12 40 12.2	−5.45	3 15.5	6	10 26 54.25	+1.151	+11 24 28.0	−6.63	1 26.8
7	10 14 4.22	0.962	12 38 0.9	5.50	3 12.0	7	10 27 21.94	1.155	11 21 48.7	6.65	1 23.4
8	10 14 27.42	0.971	12 35 48.3	5.55	3 8.4	8	10 27 49.70	1.159	11 19 8.9	6.68	1 19.9
9	10 14 50.83	0.980	12 33 34.6	5.60	3 4.9	9	10 28 17.55	1 162	11 16 28.5	6.70	1 16.4
10	10 15 14.44	0.988	12 31 19.7	5.65	3 1.4	10	10 28 45.48	1.165	11 13 47.5	6.72	1 12.9
11	10 15 38.25	+0.996	+12 29 3.6	−5.70	2 57.8	11	10 29 13.49	+1.168	+11 11 6.0	−6.74	1 9.5
12	10 16 2.26	1.004	12 26 46.4	5 75	2 54.2	12	10 29 41.57	1.171	11 8 24.1	6.76	1 6.0
13	10 16 26.46	1.012	12 24 28.1	5.79	2 50.7	13	10 30 9.71	1.174	11 5 41.8	6.78	1 2.6
14	10 16 50.86	1.020	12 22 8.6	5.84	2 47.2	14	10 30 37.93	1 177	11 2 59.0	6.80	0 59.1
15	10 17 15.44	1.028	12 19 48.1	5.89	2 43.7	15	10 31 6.22	1.180	11 0 15.7	6.82	0 55.7
16	10 17 40.20	+1.035	+12 17 26.5	−5.93	2 40.2	16	10 31 34.55	+1.182	+10 57 32.2	−6.83	0 52.2
17	10 18 5.13	1.042	12 15 3.8	5.97	2 36.7	17	10 32 2.93	1.184	10 54 48.2	6.84	0 48.7
18	10 18 30.24	1.049	12 12 40.2	6.01	2 33.1	18	10 32 31.36	1.186	10 52 3.9	6.85	0 45.2
19	10 18 55.51	1.056	12 10 15.5	6.05	2 29.6	19	10 32 59.84	1.188	10 49 19.3	6.86	0 41.8
20	10 19 20.94	1.063	12 7 49.9	6.09	2 26.1	20	10 33 28.35	1.189	10 46 34.5	6.87	0 38.3
21	10 19 46.54	+1.070	+12 5 23.4	−6.13	2 22.6	21	10 33 56.90	+1.190	+10 43 49.4	−6.88	0 34.9
22	10 20 12.30	1.076	12 2 55.9	6.17	2 19 1	22	10 34 25.48	1.191	10 41 4.0	6.89	0 31.4
23	10 20 38.20	1.082	12 0 27.5	6.20	2 15 6	23	10 34 54.03	1.192	10 38 18.5	6.90	0 28.0
24	10 21 4.24	1.088	11 57 58.3	6.24	2 12.1	24	10 35 22.71	1.193	10 35 32.8	6.91	0 24.5
25	10 21 30.43	1.094	11 55 28.2	6.28	2 8.6	25	10 35 51.35	1.194	10 32 46.9	6.91	0 21.1
26	10 21 56.75	+1.100	+11 52 57.3	−6.31	2 5.1	26	10 36 20.02	+1.195	+10 30 0.9	−6.92	0 17.6
27	10 22 23.21	1.105	11 50 25.5	6.34	2 1.6	27	10 36 48.69	1.195	10 27 14 8	6.92	0 14.2
28	10 22 49.79	1.110	11 47 53.0	6.37	1 58.1	28	10 37 17.37	1 195	10 24 28.6	6.92	0 10.7
29	10 23 16.59	1.115	11 45 19.7	6 40	1 54.7	29	10 37 46.05	1.195	10 21 42.4	6.92	0 7.2
30	10 23 43.34	1.120	11 42 45.6	6.43	1 51.2	30	10 38 14.73	1.195	10 18 56.1	6.93	0 3.7
31	10 24 10.29	+1.125	+11 40 10.9	−6.46	1 47.7	31	10 38 43.41	+1.194	+10 16 9.8	−6.93	0 0.3 23 56.8
32	10 24 37.35	+1.130	+11 37 35.4	−6.49	1 44.2	32	10 39 12.08	+1.194	+10 13 23.5	−6.93	23 53.4

Day of the Month.	5th.	13th.	21st.	29th.	Day of the Month.	6th.	14th.	22d.	30th.
Polar Semidiameter . .	7″.9	7″.8	7″.7	7″.7	Polar Semidiameter . .	7″.6	7″.6	7″.6	7″.6
Horizontal Parallax . .	0.9	0.9	0.9	0.9	Horizontal Parallax . .	0.9	0.9	0.9	0.9

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	10 39 12.08	+1.194	+10 13 23.5	−6.93	23 53.4	1	10 53 9.35	+1.106	+8 52 24.6	−6.40	22 9.3
2	10 39 40.74	1.194	10 10 37.2	6.93	23 49.9	2	10 53 35.82	1.100	8 49 51.4	6.37	22 5.8
3	10 40 9.39	1.193	10 7 51.0	6.92	23 46.5	3	10 54 2.15	1.094	8 47 19.1	6.34	22 2.3
4	10 40 38.03	1.193	10 5 4.8	6.92	23 43.0	4	10 54 28.34	1.088	8 44 47.7	6.30	21 58.8
5	10 41 6.64	1.192	10 2 18.8	6.91	23 39.6	5	10 54 54.40	1.082	8 42 17.2	6.26	21 55.3
6	10 41 35.23	+1.191	+ 9 59 32.9	−6.91	23 36.1	6	10 55 20.31	+1.076	+8 39 47.5	−6.22	21 51.8
7	10 42 3.79	1.190	9 56 47.1	6.90	23 32.7	7	10 55 46.06	1.070	8 37 18.9	6.18	21 48.3
8	10 42 32.31	1.188	9 54 1.4	6.90	23 29.2	8	10 56 11.65	1.063	8 34 51.4	6.14	21 44.7
9	10 43 0.79	1.186	9 51 16.0	6.89	23 25.7	9	10 56 37.09	1.056	8 32 24.7	6.10	21 41.2
10	10 43 29.23	1.184	9 48 30.9	6.88	23 22.2	10	10 57 2.36	1.049	8 29 59.1	6.05	21 37.7
11	10 43 57.63	+1.182	+ 9 45 46.0	−6.87	23 18.8	11	10 57 27.46	+1.042	+8 27 34.7	−6.00	21 34.2
12	10 44 25.99	1.180	9 43 1.3	6.86	23 15.3	12	10 57 52.39	1.035	8 25 11.3	5.95	21 30.7
13	10 44 54.28	1.178	9 40 17.0	6.85	23 11.9	13	10 58 17.14	1.028	8 22 49.0	5.90	21 27.2
14	10 45 22.51	1.175	9 37 33.0	6.83	23 8.4	14	10 58 41.70	1.020	8 20 27.9	5.85	21 23.7
15	10 45 50.68	1.172	9 34 49.4	6.81	23 5.0	15	10 59 6.06	1.012	8 18 8.1	5.80	21 20.2
16	10 46 18.79	+1.169	+ 9 32 6.2	−6.79	23 1.5	16	10 59 30.26	+1.004	+8 15 49.5	−5.75	21 16.6
17	10 46 46.81	1.166	9 29 23.4	6.77	22 58.0	17	10 59 54.26	0.996	8 13 32.1	5.70	21 13.1
18	10 47 14.77	1.163	9 26 41.1	6.75	22 54.5	18	11 0 18.06	0.988	8 11 16.0	5.65	21 9.5
19	10 47 42.64	1.160	9 23 59.3	6.73	22 51.1	19	11 0 41.64	0.979	8 9 1.3	5.59	21 6.0
20	10 48 10.43	1.156	9 21 17.9	6.71	22 47.6	20	11 1 5.01	0.970	8 6 47.9	5.53	21 2.4
21	10 48 38.13	+1.152	+ 9 18 37.1	−6.69	22 44.1	21	11 1 28.17	+0.961	+8 4 35.9	−5.47	20 58.9
22	10 49 5.73	1.148	9 15 56.9	6.67	22 40.6	22	11 1 51.11	0.952	8 2 25.3	5.41	20 55.3
23	10 49 33.24	1.144	9 13 17.3	6.65	22 37.2	23	11 2 13.83	0.943	8 0 16.2	5.35	20 51.8
24	10 50 0.65	1.140	9 10 38.2	6.62	22 33.7	24	11 2 36.33	0.933	7 58 8.5	5.29	20 48.2
25	10 50 27.95	1.136	9 7 59.9	6.59	22 30.2	25	11 2 58.60	0.923	7 56 2.3	5.23	20 44.7
26	10 50 55.14	+1.131	+ 9 5 22.2	−6.56	22 26.7	26	11 3 20.63	+0.913	+7 53 57.6	−5.16	20 41.1
27	10 51 22.23	1.126	9 2 45.2	6.53	22 23.2	27	11 3 42.43	0.903	7 51 54.4	5.10	20 37.5
28	10 51 49.19	1.121	9 0 8.9	6.50	22 19.7	28	11 4 3.99	0.893	7 49 52.9	5.04	20 33.9
29	10 52 16.03	1.116	8 57 33.3	6.47	22 16.3	29	11 4 25.31	0.883	7 47 52.9	4.97	20 30.3
30	10 52 42.75	1.111	8 54 58.5	6.44	22 12.8	30	11 4 46.38	0.873	7 45 54.5	4.90	20 26.7
31	10 53 9.35	+1.106	+ 8 52 24.6	−6.40	22 9.3	31	11 5 7.20	+0.862	+7 43 57.7	−4.83	20 23.1
32	10 53 35.82	+1.100	+ 8 49 51.4	−6.37	22 5.8	32	11 5 27.76	+0.851	+7 42 2.6	−4.76	20 19.5

Day of the Month.	7th.	15th.	23d.	Day of the Month.	1st.	9th.	17th.	25th.
Polar Semidiameter	7″.6	7″.6	7″.6	Polar Semidiameter . .	7″.7	7″.7	7″.8	7″.9
Horizontal Parallax	0.9	0.9	0.9	Horizontal Parallax . .	0.9	0.9	0.9	0.9

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	11 5 27.76	+0.851	+7 42 2.6	−4.76	20 19.5
2	11 5 48.07	0.840	7 40 9.2	4.69	20 15.9
3	11 6 8.11	0.829	7 38 17.6	4.62	20 12.3
4	11 6 27.87	0.818	7 36 27.7	4.55	20 8.7
5	11 6 47.37	0.807	7 34 39.5	4.47	20 5.1
6	11 7 6.60	+0.795	+7 32 53.1	−4.40	20 1.5
7	11 7 25.54	0.783	7 31 8.6	4.32	19 57.9
8	11 7 44.19	0.771	7 29 26.0	4.24	19 54.3
9	11 8 2.55	0.759	7 27 45.3	4.16	19 50.6
10	11 8 20.62	0.747	7 26 6.4	4.08	19 47.0
11	11 8 38.39	+0.734	+7 24 29.6	−4.00	19 43.4
12	11 8 55 86	0.721	7 22 54.7	3.92	19 39.7
13	11 9 13.01	0.708	7 21 21.9	3.84	19 36.0
14	11 9 29.86	0.695	7 19 51.0	3.75	19 32.4
15	11 9 46.39	0.682	7 18 22.2	3.66	19 28.7
16	11 10 2.60	+0.669	+7 16 55.6	−3.57	19 25.0
17	11 10 18.49	0.656	7 15 31.0	3.48	19 21.4
18	11 10 34.06	0.642	7 14 8.6	3.39	19 17.7
19	11 10 49.29	0.628	7 12 48.3	3.30	19 14.0
20	11 11 4.19	0.614	7 11 30.2	3.21	19 10.3
21	11 11 18.75	+0.600	+7 10 14.3	−3.12	19 6.6
22	11 11 32.98	0.586	7 9 0.5	3.03	19 2.9
23	11 11 46.87	0.572	7 7 49.1	2.93	18 59.2
24	11 12 0.41	0.557	7 6 39.9	2.84	18 55.5
25	11 12 13.60	0 542	7 5 32.9	2.74	18 51.8
26	11 12 26.44	+0.528	+7 4 28.2	−2.65	18 48.1
27	11 12 38.91	0.513	7 3 25.9	2 56	18 44.3
28	11 12 51.04	0.498	7 2 25.9	2.46	18 40.6
29	11 13 2.81	0.483	7 1 28.2	2.36	18 36.9
30	11 13 14.22	0 468	7 0 32.8	2.26	18 33.1
31	11 13 25.26	+0.453	+6 59 39.9	−2.16	18 29.3
32	11 13 35.93	+0.438	+6 58 49.4	−2.06	18 25.6

Day of the Month.	2d.	10th.	18th.	26th.
	″	″	″	″
Polar Semidiameter . .	7.9	8.0	8.1	8.2
Horizontal Parallax . .	0.9	0.9	0.9	0.9

DECEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	11 13 25.26	+0.453	+6 59 39.9	−2.16	18 29.3
2	11 13 35.93	0.438	6 58 49.4	2.06	18 25.6
3	11 13 46.22	0.422	6 58 1.3	1.96	18 21.8
4	11 13 56.14	0.406	6 57 15.6	1.86	18 18.1
5	11 14 5.68	0.390	6 56 32.3	1.75	18 14.3
6	11 14 14.64	+0.374	+6 55 51.6	−1.65	18 10.5
7	11 14 23.61	0.358	6 55 13.3	1.55	18 6.7
8	11 14 32.00	0.342	6 54 37.5	1.45	18 2.9
9	11 14 39.99	0.325	6 54 4.2	1.34	17 59.1
10	11 14 47.59	0.308	6 53 33.5	1.23	17 55.3
11	11 14 54.79	+0 292	+6 53 5.4	−1.13	17 51.5
12	11 15 1.60	0.275	6 52 39.8	1.02	17 47.6
13	11 15 8.00	0.259	6 52 16.8	0.91	17 43.8
14	11 15 14.00	0.242	6 51 56.3	0.80	17 40.0
15	11 15 19.60	0.225	6 51 38.5	0.69	17 36.1
16	11 15 24.79	+0.208	+6 51 23.2	−0.59	17 32.3
17	11 15 29.58	0.191	6 51 10.5	0.48	17 28.4
18	11 15 33.97	0.174	6 51 0.4	0.37	17 24.5
19	11 15 37.94	0.157	6 50 52.9	0.26	17 20.7
20	11 15 41.51	0.140	6 50 48.0	0.15	17 16.8
21	11 15 44.66	+0.123	+6 50 45.7	−0.05	17 12.9
22	11 15 47.41	0.106	6 50 46.0	+0.06	17 9.0
23	11 15 49.75	0.089	6 50 48.9	0.17	17 5.1
24	11 15 51.69	0.072	6 50 54.5	0.28	17 1.2
25	11 15 53.21	0.055	6 51 2.5	0.39	16 57.3
26	11 15 54.33	+0.038	+6 51 13.1	+0.50	16 53.4
27	11 15 55.03	0.021	6 51 26.3	0.60	16 49.5
28	11 15 55.33	+0.004	6 51 42.1	0.71	16 45.5
29	11 15 55.20	−0.013	6 52 0.5	0.82	16 41.6
30	11 15 54.68	0.030	6 52 21.4	0.92	16 37.7
31	11 15 53.74	−0.047	+6 52 44.8	+1.03	16 33.7
32	11 15 52.40	−0.065	+6 53 10.8	+1.14	16 29.7

Day of the Month.	4th.	12th.	20th.	28th.	36th.
	″	″	″	″	″
Polar Semidiameter . .	8.4	8.5	8.6	8.7	8.8
Horizontal Parallax . .	0.9	1.0	1.0	1.0	1.0

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign − indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

Month and Day.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination.	Var. of Decl. for 1 Day.	Meridian Passage.	Month and Day.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination	Var. of Decl. for 1 Day.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
Jan. 2	13 38 34.36	+5.911	−9 37 30.0	−32.31	18 47.3	July 1	13 24 26.92	+0.117	− 8 15 22.0	− 3.17	6 45.4
6	13 38 56.43	5.120	9 39 30.0	27.71	18 31.9	5	13 24 28.96	0.902	8 15 44.0	7.84	6 29.7
10	13 39 15.30	4 310	9 41 11.5	23.01	18 16.5	9	13 24 34.14	1.690	8 16 24.7	12.51	6 14.1
14	13 39 30.89	3.482	9 42 34.1	18.24	18 1.0	13	13 24 42.48	2.480	8 17 24.1	17.17	5 58.5
18	13 39 43.14	2.638	9 43 37.4	13.39	17 45.4	17	13 24 53.97	3.264	8 18 42.1	21.81	5 42.9
22	13 39 51.99	+1.785	−9 44 21.2	− 8.50	17 29.9	21	13 25 8.58	+4.039	− 8 20 18.5	−26.38	5 27.4
26	13 39 57.42	0.930	9 44 45.4	− 3.61	17 14.2	25	13 25 26.27	4.800	8 22 12.9	30.83	5 12.0
30	13 39 59.43	+0.080	9 44 50.1	+ 1.23	16 58.5	29	13 25 46.96	5.542	8 24 25.0	35.16	4 56.6
Feb. 3	13 39 58.07	−0.760	9 44 35.6	6.00	16 42.7	Aug. 2	13 26 10.58	6.265	8 26 54.0	39.36	4 41.3
7	13 39 53.37	1.589	9 44 2.2	10.70	16 26.9	6	13 26 37.05	6.970	8 29 39.6	43.42	4 26.0
11	13 39 45.37	−2.407	−9 43 10.1	+15.33	16 11.1	10	13 27 6.31	+7.656	− 8 32 41.2	−47.36	4 10.8
15	13 39 34.14	3.207	9 41 59.6	19.85	15 55.1	14	13 27 38.28	8.321	8 35 58.3	51.16	3 55.6
19	13 39 19.75	3.981	9 40 31.5	24.23	15 39.2	18	13 28 12.85	8.958	8 39 30.2	54.77	3 40.4
23	13 39 2.33	4.724	9 38 46.1	28.41	15 23.2	22	13 28 49.90	9.564	8 43 16.2	58.18	3 25.3
27	13 38 42.02	5.425	9 36 44.5	32.37	15 7.1	26	13 29 29.31	10.137	8 47 15.4	61.37	3 10.2
Mar. 3	13 38 18.99	−6.084	−9 34 27.5	+36.08	14 51.0	30	13 30 10.95	10.677	− 8 51 26.9	−64.35	2 55.2
7	13 37 53.40	6.699	9 31 56.2	39.54	14 34.8	Sept. 3	13 30 54.69	11.187	8 55 49.9	67.12	2 40.2
11	13 37 25.45	7.269	9 29 11.5	42.73	14 18.6	7	13 31 40.40	11.666	9 0 23.6	69.69	2 25.2
15	13 36 55.32	7.789	9 26 14.7	45.66	14 2.4	11	13 32 27.97	12.110	9 5 7.2	72.06	2 10.3
19	13 36 23.21	8.254	9 23 6.7	48.26	13 46.1	15	13 33 17.23	12.517	9 9 59.8	74.19	1 55.4
23	13 35 49.37	−8.658	−9 19 49.1	+50.51	13 29.8	19	13 34 8.04	12.881	− 9 15 0.3	−76.04	1 40.5
27	13 35 14.05	8.992	9 16 23.2	52.38	13 13.5	23	13 35 0.23	13.204	9 20 7.8	77.64	1 25.6
31	13 34 37.51	9.263	9 12 50.5	53.86	12 57.2	27	13 35 53.61	13.485	9 25 21.1	78.97	1 10.8
Apr. 4	13 34 0.03	9.468	9 9 12.8	54.97	12 40.8	Oct. 1	13 36 48.06	13.729	9 30 39.2	80.07	0 56.0
8	13 33 21.86	9.610	9 5 31.3	55.72	12 24.5	5	13 37 43.39	13.932	9 36 1.4	80.95	0 41.2
12	13 32 43.24	−9.688	−9 1 47.5	+56.09	12 8.1	9	13 38 39.46	14.095	− 9 41 26.5	−81.56	0 26.4
16	13 32 4.44	9.698	8 58 3.0	56.08	11 51.7	13	13 39 36.09	14.212	9 46 53.6	81.94	0 11.6
20	13 31 25 75	9.637	8 54 19.4	55.65	11 35.3	17	13 40 33.09	14.281	9 52 21.7	82.02	23 53.1
24	13 30 47.44	9.506	8 50 38.4	54.81	11 19.0	21	13 41 30.27	14.302	9 57 49.4	81.81	23 38.3
28	13 30 9.79	9.308	8 47 1.5	53.57	11 2.6	25	13 42 27.45	14.279	10 3 15.8	81.35	23 23.5
May 2	13 29 33.06	−9.051	−8 43 30.3	+51.98	10 46.3	29	13 43 24.44	14.211	−10 8 39.9	−80.64	23 8.7
6	13 28 57.46	8.736	8 40 6.1	50.05	10 30.0	Nov. 2	13 44 21.08	14.101	10 14 0.6	79.70	22 54.0
10	13 28 23.24	8.366	8 36 50.3	47.80	10 13.7	6	13 45 17.19	13.946	10 19 17.1	78.51	22 39.2
14	13 27 50.61	7.940	8 33 44.1	45.22	10 57.4	10	13 46 12.59	13.742	10 24 28.4	77.05	22 24.4
18	13 27 19.79	7.459	8 30 48.9	42 32	9 41.2	14	13 47 7.06	13.489	10 29 33.2	75.32	22 9.5
22	13 26 51.00	−6.927	−8 28 6.0	+39.10	9 25.0	18	13 48 0.43	13.166	−10 34 30.6	−73.32	21 54.7
26	13 26 24.43	6.350	8 25 36.5	35.61	9 8.8	22	13 48 52.48	12.838	10 39 19.5	71.09	21 39.8
30	13 26 0.25	5.735	8 23 21.4	31.90	8 52.7	26	13 49 43 07	12.449	10 43 59.1	68.65	21 24.9
June 3	13 25 38.59	5.088	8 21 21.5	28.01	8 36.6	30	13 50 32.02	12.018	10 48 28.5	66.00	21 10.0
7	13 25 19.58	4.412	8 19 37.6	23.94	8 20.6	Dec. 4	13 51 19.16	11.544	10 52 46.8	63.13	20 55.0
11	13 25 3.34	−3.706	−8 18 10.2	+19.71	8 4.6	8	13 52 4.32	11.025	−10 56 53.2	−60.03	20 40.1
15	13 24 49.97	2.973	8 17 0.1	15.31	7 48.7	12	13 52 47.31	10.462	11 0 46.8	56.71	20 25.0
19	13 24 39.58	2.218	8 16 7.9	10.78	7 32.8	16	13 53 27.96	9.857	11 4 26.6	53.18	20 10.0
23	13 24 32.25	1.447	8 15 34.0	6.16	7 16.9	20	13 54 6.12	9.215	11 7 52.0	49.47	19 54.9
27	13 24 28.02	−0.667	8 15 18.6	+ 1.50	7 1.1	24	13 54 41.63	8.541	11 11 2.2	45.61	19 39.7
July 1	13 24 26.92	+0.117	−8 15 22.0	− 3.17	6 45.4	28	13 55 14.40	+7.838	−11 13 56.7	−41.62	19 24.5
5	13 24 28.96	+0.902	−8 15 44.0	− 7.84	6 29.7	32	13 55 44.29	+7.102	−11 16 35.0	−37.50	19 9.3

Greatest horizontal parallax,	April 14, 0″.51.	Greatest semidiameter,	April 14, 1″.92.
Least horizontal parallax,	October 19, 0″.45.	Least semidiameter,	October 19, 1″.72.

GREENWICH MEAN TIME.

Month and Day.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination.	Var. of Decl. for 1 Day.	Meridian Passage.	Month and Day.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination	Var. of Decl. for 1 Day.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
Jan. 2	4 1 45.51	−5.067	+18 57 27.6	−11.74	9 11.9	July 1	4 15 49.05	+8.103	+19 41 15.9	+18.85	21 34.4
6	4 1 26.07	4.653	18 56 43.3	10.41	8 55.9	5	4 16 20.90	7.816	19 42 29.3	17.86	21 19.2
10	4 1 8.32	4.215	18 56 4.4	9.03	8 39.9	9	4 16 51.54	7.502	19 43 38.7	16.82	21 4.0
14	4 0 52.39	3.744	18 55 31.2	7.55	8 23.9	13	4 17 20.88	7.162	19 44 43.8	15.73	20 48.7
18	4 0 38.40	3.248	18 55 4.1	5.99	8 7.9	17	4 17 48.80	6.792	19 45 44.5	14.60	20 33.5
22	4 0 26.43	−2.732	+18 54 43.3	− 4.41	7 52.0	21	4 18 15.18	+6.396	+19 46 40.5	+13.40	20 18.2
26	4 0 16.57	2.196	18 54 28.9	2.77	7 36.1	25	4 18 39.94	5.978	19 47 31.7	12.19	20 2.8
30	4 0 8.88	1.647	18 54 21.2	− 1.10	7 20.2	29	4 19 2.98	5.540	19 48 18.0	10.95	19 47.5
Feb. 3	4 0 3.41	1.088	18 54 20.1	+ 0.57	7 4.4	Aug. 2	4 19 24.24	5.086	19 48 59.3	9.71	19 32.1
7	4 0 0.19	−0.529	18 54 25.7	2.25	6 48.6	6	4 19 43.64	4.612	19 49 35.6	8.42	19 16.7
11	3 59 59.24	+0.048	+18 54 38.0	+ 3.93	6 32.9	10	4 20 1.11	+4.118	+19 50 6.6	+ 7.11	19 1.3
15	4 0 0.58	0.625	18 54 57.1	5.60	6 17.2	14	4 20 16.56	3.606	19 50 32.4	5.78	18 45.8
19	4 0 4.24	1.202	18 55 22.8	7.24	6 1.6	18	4 20 29.94	3.078	19 50 52.8	4.41	18 30.3
23	4 0 10.19	1.773	18 55 55.0	8.87	5 45.9	22	4 20 41.17	2.540	19 51 7.7	3.06	18 14.7
27	4 0 18.42	2.340	18 56 33.7	10.46	5 30.3	26	4 20 50.25	1.995	19 51 17.3	1.72	17 59.1
Mar. 3	4 0 28.69	+2.891	+18 57 18.6	+11.97	5 14.8	30	4 20 57.14	+1.445	+19 51 21.5	+ 0.39	17 43.5
7	4 0 41.53	3.429	18 58 9.4	13.44	4 59.3	Sept. 3	4 21 1.80	0.888	19 51 20.4	− 0.95	17 27.9
11	4 0 56.31	3.959	18 59 6.0	14.84	4 43.8	7	4 21 4.24	+0.331	19 51 13.9	2.28	17 12.2
15	4 1 13.18	4.473	19 0 8.0	16.16	4 28.3	11	4 21 4.44	−0.232	19 51 2.2	3.59	16 56.5
19	4 1 32.06	4.970	19 1 15.2	17.44	4 12.9	15	4 21 2.39	0.791	19 50 45.2	4.90	16 40.7
23	4 1 52.90	+5.447	+19 2 27.4	+18.64	3 57.6	19	4 20 58.12	−1.344	+19 50 23.1	− 6.14	16 24.9
27	4 2 15.60	5.899	19 3 44.2	19.74	3 42.2	23	4 20 51.65	1.889	19 49 56.1	7.37	16 9.0
31	4 2 40.06	6.327	19 5 5.2	20.74	3 26.9	27	4 20 43.03	2.417	19 49 24.2	8.57	15 53.2
Apr. 4	4 3 6.18	6.730	19 6 30.0	21.65	3 11.6	Oct. 1	4 20 32.33	2.931	19 48 47.6	9.69	15 37.3
8	4 3 33.87	7.109	19 7 58.3	22.48	2 56.3	5	4 20 19.60	3.432	19 48 6.7	10.78	15 21.3
12	4 4 3.02	+7.463	+19 9 29.7	+23.20	2 41.1	9	4 20 4.90	−3.913	+19 47 21.4	−11.84	15 5.3
16	4 4 33.54	7.790	19 11 3.8	23.85	2 25.9	13	4 19 48.33	4.369	19 46 32.1	12.81	14 49.3
20	4 5 5.30	8.088	19 12 40.4	24.40	2 10.7	17	4 19 29.98	4.800	19 45 39.0	13.71	14 33.3
24	4 5 38.20	8.356	19 14 18.9	24.83	1 55.5	21	4 19 9.97	5.199	19 44 42.5	14.53	14 17.2
28	4 6 12.10	8.589	19 15 58.9	25.16	1 40.3	25	4 18 48.43	5.566	19 43 42.8	15.26	14 1.1
May 2	4 6 46.87	+8.792	+19 17 40.1	+25.40	1 25.2	29	4 18 25.49	−5.897	+19 42 40.5	−15.91	13 45.0
6	4 7 22.40	8.968	19 19 22.0	25.55	1 10.0	Nov. 2	4 18 1.30	6.192	19 41 35.7	16.48	13 28.9
10	4 7 58.57	9.111	19 21 4.4	25.63	0 54.9	6	4 17 36.00	6.454	19 40 28.8	16.95	13 12.8
14	4 8 35.25	9.225	19 22 46.9	25.59	0 39.8	10	4 17 9.72	6.675	19 39 20.2	17.33	12 56.6
18	4 9 12.33	9.307	19 24 29.0	25.47	0 24.7	14	4 16 42.66	6.849	19 38 10.3	17.60	12 40.4
22	4 9 49.66	+9.353	+19 26 10.5	+25.25	0 9.5	18	4 16 14.99	−6.978	+19 36 59.6	−17.72	12 24.2
26	4 10 27.11	9.367	19 27 50.9	24.94	23 50.7	22	4 15 46.90	7.058	19 35 48.7	17.73	12 8.0
30	4 11 4.55	9.349	19 29 29.9	24.55	23 35.6	26	4 15 18.58	7.097	19 34 37.9	17.64	11 51.8
June 3	4 11 41.86	9.301	19 31 7.2	24.07	23 20.5	30	4 14 50.18	7.091	19 33 27.7	17.46	11 35.6
7	4 12 18.92	9.224	19 32 42.4	23.53	23 5.3	Dec. 4	4 14 21.91	7.039	19 32 18.4	17.15	11 19.4
11	4 12 55.61	+9.115	+19 34 15.4	+22.94	22 50.2	8	4 13 53.93	−6.941	+19 31 10.7	−16.71	11 3.2
15	4 13 31.80	8.975	19 35 45.8	22.25	22 35.1	12	4 13 26.44	6.798	19 30 5.0	16.15	10 47.1
19	4 14 7.37	8.803	19 37 13.3	21.50	22 19.9	16	4 12 59.61	6.606	19 29 1.7	15.47	10 30.9
23	4 14 42.18	8.597	19 38 37.7	20.67	22 4.8	20	4 12 33.65	6.369	19 28 1.4	14.68	10 14.8
27	4 15 16.11	8.363	19 39 58.6	19.78	21 49.6	24	4 12 8.71	6.092	19 27 4.4	13.79	9 58.6
July 1	4 15 49.05	+8.103	+19 41 15.9	+18.85	21 34.4	28	4 11 44.96	−5.778	+19 26 11.2	−12.80	9 42.5
5	4 16 20.90	+7.816	+19 42 29.3	+17.86	21 19.2	32	4 11 22.53	−5.429	+19 25 22.1	−11.74	9 26.4

Greatest horizontal parallax,	November 24, 0″.31.	**Greatest semidiameter,**	November 24, 1″.33.
Least horizontal parallax,	**May** 23, 0″.29.	**Least semidiameter,**	**May** 23, 1″.25.

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Jan. 0	329 26 7.2	3 54 2.6	− 5 23.1	−6 50 27.4	+ 6 5.5	9.5950178	0.1050465	0.0994123
2	337 27 46.3	4 7 51.4	8 23.9	6 33 58.1	10 29.6	9.5823237	0.0933973	0.0869810
4	345 58 31.8	4 23 8.3	10 53.0	6 8 6.0	15 28.1	9.5689666	0.0801424	0.0728590
6	355 1 13.4	4 39 45.8	12 28.5	5 31 44.9	20 57.6	9.5551929	0.0651108	0.0568765
8	4 38 17.7	4 57 26.8	12 49.3	4 44 1.4	26 48.3	9.5413453	0.0481363	0.0388742
10	14 51 22.4	5 15 40.0	−11 37.2	−3 44 30.4	+32 41.2	9.5278779	0.0290764	0.0187359
12	25 40 48.2	5 33 38.4	8 45.0	2 33 35.7	38 5.9	9.5153573	0.0078524	9.9964346
14	37 5 3.9	5 50 18.3	− 4 22.9	−1 12 52.7	42 22.0	9.5044419	9.9845044	9.9720987
16	49 0 15.8	6 4 20.3	+ 0 53.5	+0 14 35.6	44 43.5	9.4958264	9.9592721	9.9461008
18	61 19 41.3	6 14 21.3	6 11.1	1 44 18.1	44 30.8	9.4901491	9.9326850	9.9191506
20	73 54 1.3	6 19 6.1	+10 24.3	+3 10 42.4	+41 24.3	9.4878779	9.9056508	9.8923617
22	86 31 59.5	6 17 53.2	12 38.7	4 28 6.9	35 35.8	9.4892118	9.8794887	9.8672489
24	99 1 36.5	6 10 47.0	12 28.5	5 31 45.0	27 46.8	9.4940332	9.8558701	9.8455781
26	111 11 41.4	5 58 32.6	10 4.5	6 18 33.7	18 57.4	9.5019362	9.8365825	9.8290647
28	122 53 13.3	5 42 26.8	6 4.7	6 47 34.7	10 8.0	9.5123161	9.8231637	9.8189669
30	134 0 2.6	5 24 5.1	+ 1 20.9	+6 59 36.4	+ 2 4.2	9.5244827	9.8165049	9.8157516
Feb. 1	144 28 58.0	5 4 47.8	− 3 18.0	6 56 39.8	− 4 47.2	9.5377611	9.8166254	9.8190076
3	154 19 23.0	4 45 43.8	7 17.1	6 41 21.3	10 17.6	9.5515575	9.8227441	9.8276631
5	163 32 33.5	4 27 39.4	10 15.8	6 16 21.1	14 30.3	9.5653877	9.8335856	9.8403359
7	172 10 59.0	4 11 2.1	12 6.2	5 44 5.6	17 34.8	9.5788812	9.8477469	9.8556663
9	180 17 49.0	3 56 5.0	−12 50.6	+5 6 39.3	−19 43.3	9.5917677	9.8639586	9.8725068
11	187 56 28.1	3 42 51.2	12 36.3	4 25 42.2	21 7.4	9.6038595	9.8812109	9.8899877
13	195 10 21.1	3 31 18.0	11 33.5	3 42 32.7	21 57.3	9.6150319	9.8987686	9.9074988
15	202 2 43.3	3 21 19.5	9 52.7	2 58 10.3	22 21.4	9.6252066	9.9161344	9.9246409
17	208 36 37.2	3 12 48.2	7 44.5	2 13 19.9	22 26.2	9.6343380	9.9329924	9.9411694
19	214 54 49.5	3 5 37.0	− 5 17.9	+1 28 34.9	−22 16.8	9.6424036	9.9491581	9.9569484
21	220 59 53.9	2 59 38.9	2 41.9	0 44 20.2	21 56.6	9.6493948	9.9645348	9.9719138
23	226 54 9.6	2 54 47.3	− 0 3.3	+0 0 54.2	21 28.2	9.6553124	9.9790849	9.9860485
25	232 39 44.1	2 50 57.2	+ 2 31.5	−0 41 28.6	20 53.7	9.6601621	9.9928070	9.9993641
27	238 18 36.4	2 48 4.2	4 57.4	1 22 37.2	20 14.0	9.6639512	0.0057234	0.0118882
Mar. 1	243 52 36.5	2 46 4.6	+ 7 9.8	−2 2 21.9	−19 30.0	9.6666877	0.0178644	0.0236569
3	249 23 29.2	2 44 56.5	9 4.9	2 40 34.4	18 41.8	9.6683781	0.0292703	0.0347099
5	254 52 55.6	2 44 37.9	10 39.4	3 17 6.1	17 49.2	9.6690266	0.0399804	0.0450860
7	260 22 33.6	2 45 8.2	11 50.3	3 51 48.3	16 52.1	9.6686350	0.0500317	0.0548216
9	265 54 1.4	2 46 27.6	12 35.2	4 24 30.8	15 49.5	9.6672018	0.0594594	0.0639486
11	271 28 57.4	2 48 36.9	+12 52.1	−4 55 2.0	−14 40.5	9.6647241	0.0682927	0.0724946
13	277 9 3.4	2 51 37.8	12 39.3	5 23 7.7	13 23.8	9.6611952	0.0765563	0.0804796
15	282 56 4.7	2 55 32.8	11 55.9	5 48 31.1	11 57.8	9.6566080	0.0842663	0.0879179
17	288 51 53.3	3 0 25.6	10 41.3	6 10 51.3	10 20.3	9.6509542	0.0914346	0.0948166
19	294 58 28.1	3 6 19.7	8 55.9	6 29 43.1	8 29.0	9.6442278	0.0980631	0.1011729
21	301 17 56.5	3 13 20.2	+ 6 41.6	−6 44 36.1	− 6 20.9	9.6364266	0.1041444	0.1069753
23	307 52 37.0	3 21 32.3	4 1.6	6 54 53.4	3 52.8	9.6275560	0.1096621	0.1122006
25	314 44 58.6	3 31 2.3	+ 1 1.0	6 59 51.3	− 1 0.9	9.6176349	0.1145861	0.1168124
27	321 57 41.6	3 41 54.9	− 2 12.0	6 58 38.5	+ 2 18.6	9.6067022	0.1188728	0.1207596
29	329 33 36.7	3 54 15.0	5 26.1	6 50 15.9	6 9.4	9.5948270	0.1224634	0.1239734
31	337 35 41.6	4 8 5.2	− 8 26.4	−6 33 38.4	+10 34.0	9.5821210	0.1252777	0.1263635
33	346 6 56.3	4 23 23.4	−10 55.2	−6 7 36.9	+15 33.1	9.5687552	0.1272164	0.1278202

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Apr. 2	346 6 56.3	4 23 23.4	−10 55.2	−6 7 36.9	+15 33.1	9.5687552	0.1272164	0.1278202
4	355 10 9.0	4 40 2.0	12 29.5	5 31 5.5	21 3.0	9.5549772	0.1281570	0.1282077
6	4 47 46.6	4 57 43.8	12 49.0	4 43 11.0	26 53.8	9.5411317	0.1279524	0.1273691
8	15 1 25.6	5 15 57.1	11 35.4	3 43 28.9	32 46.4	9.5276743	0.1264355	0.1251281
10	25 51 25.2	5 33 55.2	8 41.6	2 32 24.1	38 10.5	9.5151734	0.1234237	0.1212987
12	37 16 13.0	5 50 33.0	− 4 18.9	−1 11 33.1	+42 25.2	9.5042884	0.1187312	0.1156999
14	49 11 50.5	6 4 31.0	+ 0 58.6	+0 15 59.6	44 44.5	9.4957137	0.1121870	0.1081770
16	61 31 34.7	6 14 26.0	6 15.6	1 45 41.7	44 29.5	9.4900861	0.1036578	0.0986229
18	74 6 3.8	6 19 5.8	10 27.4	3 11 59.9	41 20.1	9.4878700	0.0930698	0.0870018
20	86 43 59.6	6 17 49.0	12 39.6	4 29 13.7	35 28.8	9.4892598	0.0804262	0.0733569
22	99 13 22.8	6 10 37.6	+12 27.2	+5 32 36.8	+27 38.8	9.4941330	0.0658114	0.0578115
24	111 23 4.8	5 58 19.1	10 1.4	6 19 9.2	18 49.1	9.5020797	0.0493820	0.0405508
26	123 4 6.5	5 42 12.0	6 0.4	6 47 53.6	9 59.9	9.5124928	0.0313476	0.0218029
28	134 10 21.0	5 23 47.2	+ 1 16.5	6 59 40.0	+ 1 57.1	9.5246821	0.0119483	0.0018156
30	144 38 40.3	5 4 29.6	− 3 22.2	6 56 30.7	− 4 53.1	9.5379733	9.9914358	9.9808403
May 2	154 28 29.2	4 45 26.3	− 7 20.4	+6 41 1.9	−10 22.2	9.5517738	9.9700607	9.9591270
4	163 41 5.8	4 27 23.1	10 18.0	6 15 53.8	14 33.6	9.5656015	9.9480696	9.9369188
6	172 19 0.0	4 10 47.2	12 7.4	5 43 32.6	17 37.2	9.5790876	9.9257052	9.9144601
8	180 25 21.7	3 55 51.8	12 50.8	5 6 2.3	19 44.8	9.5919633	9.9032148	9.8920021
10	188 3 36.1	3 42 39.6	12 35.7	4 25 2.6	21 8.4	9.6040417	9.8808560	9.8698130
12	195 17 7.3	3 31 8.0	−11 32.2	+3 41 51.5	−21 57.8	9.6151990	9.8589102	9.8481874
14	202 9 10.7	3 21 10.7	9 50.8	2 57 28.4	22 21.6	9.6253575	9.8376864	9.8274514
16	208 42 48.4	3 12 40.9	7 24.1	2 12 37.8	22 26.2	9.6344726	9.8175296	9.8079701
18	215 0 47.5	3 5 30.9	5 15.5	1 27 53.2	22 16.5	9.6425213	9.7988237	9.7901428
20	221 5 40.6	2 59 33.9	2 39.4	0 43 39.0	21 56.2	9.6494956	9.7819806	9.7743914
22	226 59 47.5	2 54 43.4	− 0 0.9	+0 0 13.9	−21 27.7	9.6553963	9.7674294	9.7611461
24	232 45 15.0	2 50 54.0	+ 2 33.9	−0 42 7.8	20 53.1	9.6602290	9.7555904	9.7508075
26	238 24 1.8	2 48 1.9	4 59.6	1 23 15.1	20 13.4	9.6640012	9.7468376	9.7437136
28	243 57 58.3	2 46 3.4	7 11.8	2 2 58.5	19 29.3	9.6667212	9.7414613	9.7400988
30	249 28 49.2	2 44 55.8	9 6.5	2 41 9.4	18 41.0	9.6683950	9.7396350	9.7400687
June 1	254 58 14.8	2 44 38.1	+10 40.7	−3 17 39.5	−17 48.4	9.6690269	9.7413901	9.7435802
3	260 27 54.2	2 45 9.3	11 51.1	3 52 19.9	16 51.2	9.6686180	9.7466123	9.7504516
5	265 59 24.6	2 46 29.2	12 35.5	4 25 0.5	15 48.5	9.6671694	9.7550579	9.7603855
7	271 34 24.5	2 48 39.3	12 52.2	4 55 29.5	14 39.4	9.6646752	9.7663860	9.7730077
9	277 14 36.3	2 51 41.2	12 38.9	5 23 32.9	13 22.6	9.6611299	9.7801982	9.7879045
11	283 1 45.2	2 55 36.9	+11 54.9	−5 48 53.5	−11 56.4	9.6565262	9.7960752	9.8046596
13	288 57 42.6	3 0 30.5	10 40.0	6 11 10.7	10 18.7	9.6508559	9.8136095	9.8228786
15	295 4 28.5	3 6 25.8	8 54.1	6 29 59.0	8 27.1	9.6441132	9.8324235	9.8422038
17	301 24 10.3	3 13 27.4	6 39.3	6 44 48.0	6 18.8	9.6362956	9.8521815	9.8623215
19	307 59 6.0	3 21 40.8	3 58.9	6 55 0.7	3 50.3	9.6274089	9.8725910	9.8829600
21	314 51 45.3	3 31 12.0	+ 0 58.1	−6 59 53.2	− 0 58.0	9.6174722	9.8934005	9.9038861
23	322 4 48.7	3 42 5.8	− 2 15.0	6 58 34.1	+ 2 22.0	9.6065246	9.9143918	9.9248940
25	329 41 6.9	3 54 27.1	5 29.1	6 50 4.3	6 13.2	9.5946361	9.9353706	9.9457993
27	337 43 37.4	4 8 18.6	8 29.1	6 33 18.5	10 38.4	9.5819190	9.9561589	9.9664286
29	346 15 20.3	4 23 38.3	10 56.9	6 7 7.7	15 38.0	9.5685453	9.9765863	9.9866103
31	355 19 4.3	4 40 18.1	−12 30.4	−5 30 26.0	+21 8.6	9.5547642	9.9964785	0.0061673
33	4 57 14.8	4 58 0.6	−12 48.6	−4 42 20.4	+26 59.4	9.5409216	0.0156528	0.0249103

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
July 1	355 19 4.3	4 40 18.1	−12 30.4	−5 30 26.0	+21 8.0	9.5547642	9.9964785	0.0061673
3	4 57 14.8	4 58 0.6	12 48.6	4 42 20.4	26 59.4	9.5409216	0.0156528	0.0249103
5	15 11 27.6	5 16 14.0	11 33.4	3 42 27.5	32 52.1	9.5274750	0.0339139	0.0426367
7	26 2 0.2	5 34 11.3	8 38.0	2 31 12.6	38 15.1	9.5149943	0.0510515	0.0591305
9	37 27 18.6	5 50 47.2	− 4 14.3	−1 10 13.8	42 28.3	9.5041400	0.0668464	0.0741723
11	49 23 21.7	6 4 42.2	+ 1 3.6	+0 17 23.2	+44 45.6	9.4956066	0.0810826	0.0875543
13	61 43 23.6	6 14 32.6	6 20.2	1 47 4.7	44 27.5	9.4900286	0.0935665	0.0991021
15	74 18 0.6	6 19 7.1	10 30.4	3 13 17.1	41 15.8	9.4878675	0.1041483	0.1086968
17	86 55 53.4	6 17 44.7	12 40.6	4 30 19.7	35 22.1	9.4893127	0.1127440	0.1162917
19	99 25 2.7	6 10 28.2	12 25.9	5 33 28.1	27 30.8	9.4942367	0.1193458	0.1219172
21	111 34 21.4	5 58 5.4	+ 9 58.2	+6 19 44.1	+18 40.8	9.5022259	0.1240199	0.1256717
23	123 14 52.7	5 41 55.6	5 56.2	6 48 12.1	9 52.0	9.5126716	0.1268927	0.1277043
25	134 20 32.9	5 23 29.4	+ 1 12.0	6 59 43.6	+ 1 50.2	9.5248822	0 1281291	0.1281902
27	144 48 16.0	5 4 12.0	− 3 26.2	6 56 21.6	− 4 58.8	9.5381850	0.1279105	0.1273120
29	154 37 29.6	4 45 9.0	7 23.7	6 40 42.6	10 26.7	9.5519886	0.1264160	0.1252429
31	163 49 32.7	4 27 6.7	−10 20.3	+6 15 26.7	−14 37.0	9.5658133	0.1238109	0.1221377
Aug. 2	172 26 56.2	4 10 32.6	12 8.5	5 42 59.9	17 39.5	9.5792912	0.1202388	0.1181292
4	180 32 50.2	3 55 38.7	12 51.0	5 5 25.7	19 46.5	9.5921552	0.1158214	0.1133267
6	188 10 40.1	3 42 28.2	12 35.1	4 24 23.3	21 9.5	9.6042199	0.1106558	0.1078171
8	195 23 50.1	3 30 58.0	11 30.9	3 41 10.3	21 58.4	9.6153620	0.1048184	0.1016664
10	202 15 35.2	3 21 2.3	− 9 49.0	+2 56 46.8	−22 21.8	9.6255043	0.0983669	0.0949242
12	208 48 57.4	3 12 33.8	7 40.0	2 11 56.1	22 26.2	9.6346024	0.0913420	0.0876229
14	215 6 43.5	3 5 25.0	5 13.1	1 27 11.6	22 16.3	9.6426343	0.0837690	0.0797825
16	221 11 25.9	2 59 29.0	− 2 36.9	+0 42 58.1	21 55.8	9.6495918	0.0756643	0.0714141
18	227 5 23.8	2 54 39.4	+ 0 1.6	−0 0 26.1	21 27.2	9.6554756	0.0670318	0.0625165
20	232 50 44.4	2 50 50.4	+ 2 36.3	−0 42 46.8	−20 52.5	9.6602918	0.0578672	0.0530822
22	238 29 26.2	2 47 59.6	5 1.7	1 23 52.9	20 12.8	9.6640479	0.0481599	0.0430976
24	244 3 19.4	2 46 2.0	7 13.5	2 3 35.0	19 28.6	9.6667515	0.0378927	0.0325426
26	249 34 8.3	2 44 55.3	9 8.1	2 41 44.4	18 40.2	9.6684093	0.0270446	0.0213949
28	255 3 33.7	2 44 38.2	10 42.0	3 18 13.0	17 47.6	9.6690255	0.0155908	0.0096289
30	260 33 13.9	2 45 10.2	+11 52.1	−3 52 51.5	−16 50.2	9.6686016	0.0035062	9.9972193
Sept. 1	266 4 47.0	2 46 31.0	12 36.1	4 25 30.2	15 47.4	9.6671361	9.9907660	9.9841439
3	271 39 51.2	2 48 41.8	12 52.2	4 55 57.0	14 38.2	9.6646260	9.9773512	9.9703871
5	277 20 8.6	2 51 44.4	12 38.4	5 23 58.0	13 21.3	9.6610650	9.9632518	9.9559469
7	283 7 24.8	2 55 41.2	11 54.1	5 49 15.9	11 54.9	9.6564452	9.9484757	9.9408429
9	289 3 32.1	3 0 35.8	+10 38.5	−6 11 30.0	−10 17.1	9.6507590	9.9330575	9.9251311
11	295 10 29.0	3 6 31.8	8 52.1	6 30 14.9	8 25.3	9.6440003	9.9170781	9.9089194
13	301 30 23.6	3 13 34.4	6 37.0	6 44 59.8	6 16.6	9.6361669	9.9006805	9.8923946
15	308 5 34.7	3 21 49.2	3 56.2	6 55 7.8	3 47.8	9.6272646	9.8841024	9.8758544
17	314 58 31.7	3 31 21.4	+ 0 55.1	6 59 55.0	− 0 55.0	9.6173127	9.8677118	9.8597470
19	322 11 55.3	3 42 16 4	− 2 18.1	−6 58 29.6	+ 2 25.4	9.6063511	9.8520457	9.8447079
21	329 48 36.0	3 54 39.2	5 32.0	6 49 52 7	6 17.1	9.5944495	9.8378474	9.8315911
23	337 51 32.1	4 8 31.9	8 31.8	6 32 58.5	10 42.8	9.5817217	9.8260782	9.8214553
25	346 23 42.5	4 23 52.7	10 58.6	6 6 38.5	15 42.8	9.5683406	9.8178734	9.8154802
27	355 27 56.5	4 40 33.6	12 31.4	5 29 46.6	21 13.6	9.5545564	9.8144120	9.8147857
29	5 6 38.4	4 58 16.5	−12 48.1	−4 41 30.4	+27 4.8	9.5407168	9.8166885	9.8201697
31	15 21 23.3	5 16 30.0	−11 31.4	−3 41 26.6	+32 57.0	9.5272809	9.8252372	9.8318523

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Oct. 1	15 21 23.3	5 16 30.0	−11 31.4	−3 41 26.6	+32 57.0	9.5272809	9.8252372	9.8318523
3	26 12 27.4	5 34 26.6	8 34.4	2 30 2.0	33 19.6	9.5148205	9.8399312	9.8493500
5	37 38 14.8	5 51 0.7	− 4 9.6	−1 8 55.5	42 31.4	9.5039968	9.8599505	9.8715511
7	49 34 41.6	6 4 52.3	+ 1 8.8	+0 16 45.4	44 46.5	9.4955043	9.8839560	9.8969648
9	61 55 0.0	6 14 38.5	6 24.7	1 48 26.1	44 25.8	9.4899758	9.9103812	9.9240210
11	74 29 43.7	6 19 7.7	+10 33.4	+3 14 32.4	+41 11.4	9.4878689	9.9377137	9.9513123
13	87 7 32.2	6 17 40.0	12 41.5	4 31 24.1	35 16.1	9.4893684	9.9646894	9.9777398
15	99 36 27.0	6 10 18.4	12 24.6	5 34 18.1	27 23.0	9.4943422	9.9903796	0.0025453
17	111 45 21.9	5 57 51.6	9 55.1	6 20 17.9	18 32.6	9.5023731	0.0141914	0.0252886
19	123 25 22.9	5 41 39.2	5 52.1	6 48 29.9	9 44.3	9.5128501	0.0358208	0.0457824
21	134 30 28.9	5 23 11.8	+ 1 7.7	+6 59 46.8	+ 1 43.4	9.5250814	0.0551766	0.0640140
23	144 57 36.8	5 3 53.8	− 3 30.2	6 56 12.5	− 5 4.4	9.5383951	0.0723100	0.0800833
25	154 46 15.4	4 44 52.1	7 26.8	6 40 23.6	10 31.0	9.5522015	0.0873559	0.0941500
27	163 57 46.2	4 26 51.6	10 22.5	6 15 0.2	14 40.2	9.5660225	0.1004884	0.1063941
29	172 34 39.8	4 10 18.4	12 9.7	5 42 27.9	17 41.9	9.5794918	0.1118903	0.1169986
31	180 40 7.3	3 55 26.2	−12 51.2	+5 4 49.7	−19 48.0	9.5923442	0.1217397	0.1261333
Nov. 2	188 17 33.6	3 42 17.2	12 34.4	4 23 44.9	21 10.4	9.6043950	0.1301980	0.1339514
4	195 30 23.1	3 30 48.6	11 29.6	3 40 30.8	21 59.0	9.6155219	0.1374085	0.1405847
6	202 21 50.8	3 20 54.2	9 47.3	2 56 6.1	22 22.1	9.6256481	0.1434937	0.1461471
8	208 54 57.9	3 12 26.8	7 37.8	2 11 15.2	22 26.1	9.6347300	0.1485572	0.1507338
10	215 12 31.4	3 5 19.3	− 5 10.8	+1 26 31.1	−22 16.1	9.6427453	0.1526864	0.1544234
12	221 17 3.6	2 59 24.3	− 2 34.5	+0 42 17.9	21 55.4	9.6496862	0.1559522	0.1572799
14	227 10 53.1	2 54 35.6	+ 0 4.0	−0 1 5.3	21 26.7	9.6555539	0.1584126	0.1593553
16	232 56 7.2	2 50 48.3	2 38.7	0 43 25.0	20 52.0	9.6603540	0.1601123	0.1606878
18	238 34 44.4	2 47 57.8	5 3.9	1 24 30.0	20 12.2	9.6640941	0.1610854	0.1613072
20	244 8 34.2	2 46 0.7	+ 7 15.6	−2 4 10.7	−19 27.9	9.6667819	0.1613569	0.1612346
22	249 39 21.4	2 44 54.9	9 9.8	2 42 18.7	18 39.5	9.6684238	0.1609418	0.1604793
24	255 8 46.8	2 44 38.6	10 43.3	3 18 45.7	17 46.8	9.6690243	0.1598465	0.1590431
26	260 38 28.4	2 45 11.1	11 53.0	3 53 22.5	16 49.3	9.6685848	0.1580685	0.1569201
28	266 10 3.9	2 46 32.7	12 36.7	4 25 59.2	15 46.5	9.6671039	0.1555965	0.1540943
30	271 45 12.6	2 48 44.4	+12 52.2	−4 56 24.0	−14 37.2	9.6645781	0.1524105	0.1505411
Dec. 2	277 25 36.1	2 51 47.7	12 37.9	5 24 22.6	13 20.0	9.6610012	0.1484816	0.1462267
4	283 12 59.6	2 55 45.2	11 53.1	5 49 37.9	11 53.5	9.6563655	0.1437705	0.1411066
6	289 9 15.7	3 0 40.7	10 37.2	6 11 49.0	10 15.5	9.6506632	0.1382275	0.1351255
8	295 16 23.5	3 6 37.7	8 50.2	6 30 30.4	8 23.4	9.6438882	0.1317916	0.1282160
10	301 36 31.0	3 13 41.4	+ 6 34.7	−6 45 11.4	− 6 14.5	9.6360385	0.1243885	0.1202975
12	308 11 57.3	3 21 57.2	3 53.5	6 55 14.8	3 45.3	9.6271202	0.1159309	0.1112751
14	315 5 11.6	3 31 30.5	+ 0 52.2	6 59 56.6	− 0 52.2	9.6171527	0.1063159	0.1010385
16	322 18 54.7	3 42 27.0	− 2 21.1	6 58 25.1	+ 2 28.6	9.6061761	0.0954264	0.0894622
18	329 55 58.1	3 54 51.2	5 35.0	6 49 41.0	6 20.9	9.5942617	0.0831284	0.0764064
20	337 59 19.4	4 8 45.2	− 8 34.4	−6 32 38.8	+10 47.1	9.5815220	0.0692767	0.0617205
22	346 31 57.8	4 24 7.2	11 0.8	6 6 9.6	15 47.7	9.5681329	0.0537188	0.0452531
24	355 36 42.0	4 40 49.3	12 32.2	5 29 7.5	21 18.8	9.5543450	0.0363076	0.0268687
26	5 15 56.6	4 58 33.2	12 47.7	4 40 40.6	27 10.2	9.5405080	0.0169258	0.0064744
28	15 31 14.8	5 16 46.7	11 29.5	3 40 26.0	33 2.2	9.5270824	9.9955197	9.9840754
30	26 22 51.8	5 34 42.5	− 8 31.2	−2 28 51.6	+38 24.0	9.5146418	9.9721682	9.9598419
32	37 49 9.1	5 51 14.7	− 4 5.1	−1 7 37.5	+42 34.4	9.5038485	9.9471612	9.9342133

VENUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Jan. 2	255 29 40.7	1 35 12.4	−0 1.3	+0 0 42.3	−5 38.7	9.8610471	0.2212851	0.2223154
6	261 50 16.9	1 35 5.9	+0 38.5	−0 21 49.3	5 36.4	9.8613063	0.2233041	0.2242513
10	268 10 28.8	1 35 0.4	1 16.5	0 44 3.3	5 30.0	9.8615408	0.2251571	0.2260213
14	274 30 21.4	1 34 56.1	1 50.6	1 5 43.7	5 19.6	9.8617479	0.2268442	0.2276252
18	280 49 59.2	1 34 53.0	2 19.3	1 26 35.0	5 5.4	9.8619252	0.2283636	0.2290596
22	287 9 26.8	1 34 51.0	+2 41.2	−1 46 22.1	−4 47.6	9.8620706	0.2297133	0.2303253
26	293 28 48.7	1 34 50.1	2 55.3	2 4 51.0	4 26.2	9.8621823	0.2308954	0.2314244
30	299 48 9.2	1 34 50.3	3 0.9	2 21 48.3	4 1.8	9.8622591	0.2319128	0.2323615
Feb. 3	306 7 32.3	1 34 51.4	2 57.8	2 37 2.0	3 34.5	9.8623001	0.2327707	0.2331401
7	312 27 1.8	1 34 53.4	2 45.9	2 50 21.1	3 4.6	9.8623047	0.2334704	0.2337606
11	318 46 40.7	1 34 56.2	+2 26.0	−3 1 35.9	−2 32.5	9.8622730	0.2340106	0.2342195
15	325 6 31.9	1 34 59.7	1 59.0	3 10 38.4	1 58.5	9.8622050	0.2343862	0.2345103
19	331 26 37.7	1 35 3.6	1 26.3	3 17 21.7	1 23.0	9.8621020	0.2345914	0.2346290
23	337 47 0.4	1 35 8.0	0 49.3	3 21 40.8	0 46.4	9.8619649	0.2346227	0.2345718
27	344 7 41.8	1 35 12.8	+0 9.9	3 23 32.2	−0 9.2	9.8617953	0.2344775	0.2343392
Mar. 3	350 28 43.2	1 35 17.9	−0 30.2	−3 22 54.3	+0 28.2	9.8615952	0.2341573	0.2339315
7	356 50 5.4	1 35 23.3	1 8.6	3 19 47.1	1 5.4	9.8613670	0.2336615	0.2333470
11	3 11 49.6	1 35 28.9	1 43.7	3 14 12.4	1 41.8	9.8611135	0.2329876	0.2325814
15	9 33 56.9	1 35 34.7	2 13.9	3 6 13.9	2 17.2	9.8608377	0.2321279	0.2316258
19	15 56 27.6	1 35 40.7	2 37.4	2 55 56.8	2 51.0	9.8605428	0.2310737	0.2304707
23	22 19 22.6	1 35 46.8	−2 53.2	−2 43 28.4	+3 22.8	9.8602327	0.2298161	0.2291091
27	28 42 42.6	1 35 53.1	3 0.5	2 28 57.2	3 52.3	9.8599108	0.2283493	0.2275363
31	35 6 28.1	1 35 59.6	2 58.8	2 12 33.7	4 19.0	9.8595813	0.2266698	0.2257500
Apr. 4	41 30 40.0	1 36 6.3	2 48.3	1 54 29.6	4 42.5	9.8592483	0.2247763	0.2237479
8	47 55 18.8	1 36 13.2	2 29.2	1 34 58.0	5 2.7	9.8589157	0.2226643	0.2215246
12	54 20 25 4	1 36 20.2	−2 2.8	−1 14 13.3	+5 19.1	9.8585880	0.2203275	0.2190714
16	60 46 0.3	1 36 27.3	1 30.2	0 52 30.8	5 31.5	9.8582690	0.2177550	0.2163769
20	67 12 3.9	1 36 34.5	0 52.9	0 30 6.8	5 39.7	9.8579632	0.2149358	0.2134309
24	73 38 36.8	1 36 41.8	−0 13.0	−0 7 18.1	5 43.7	9.8576741	0.2118609	0.2102256
28	80 5 38.7	1 36 49.1	+0 27.7	+0 15 37.9	5 43.4	9.8574058	0.2085247	0.2067578
May 2	86 33 9.6	1 36 56.3	+1 7.0	+0 38 23.6	+5 38.7	9.8571615	0.2049243	0.2030242
6	93 1 8.6	1 37 3.2	1 42.9	1 0 41.4	5 29.5	9.8569444	0.2010569	0.1990218
10	99 29 34.5	1 37 9.7	2 13.7	1 22 14.1	5 16.1	9.8567576	0.1969173	0.1947427
14	105 58 25.5	1 37 15.7	2 37.6	1 42 44.8	4 58.6	9.8566034	0.1924966	0.1901772
18	112 27 39.2	1 37 21.0	2 53.6	2 1 57.5	4 37.1	9.8564838	0.1877832	0.1853135
22	118 57 12.9	1 37 25.4	+3 0.6	+2 19 36.9	+4 12.0	9.8564005	0.1827669	0.1801428
26	125 27 2.8	1 37 28.9	2 58.4	2 35 29.3	3 43.6	9.8563545	0.1774406	0.1746597
30	131 57 4.6	1 37 31.4	2 47.1	2 49 22.0	3 12.3	9.8563464	0.1718006	0.1688626
June 3	138 27 13.8	1 37 32.8	2 27.2	3 1 4.2	2 38.4	9.8563765	0.1658457	0.1627492
7	144 57 25.3	1 37 32.7	1 59.8	3 10 26.7	2 2.5	9.8564441	0.1595729	0.1563154
11	151 27 33.8	37 31.2	+1 26.2	+3 17 22.3	+1 25.0	9.8565485	0.1529756	0.1495523
15	157 57 33.5	1 37 28.3	0 48.2	3 21 45.7	0 46.5	9.8566881	0.1460437	0.1424488
19	164 27 18.7	1 37 24.0	+0 7.8	3 23 35.9	+0 7.5	9.8568612	0.1387658	0.1349938
23	170 56 43.9	1 37 18.3	−0 32.9	3 22 45.6	−0 31.6	9.8570656	0.1311321	0.1271800
27	177 25 43.9	1 37 11.4	1 12.0	3 19 22.1	1 10.1	9.8572985	0.1231371	0.1190031
31	183 54 13.8	1 37 3.3	−1 47.3	+3 13 26.5	−1 47.5	9.8575568	0.1147780	0.1104617
35	190 22 9.4	1 36 54.3	−2 17.2	+3 5 3.8	−2 23.5	9.8578373	0.1060531	0.1015520

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GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
July 1	183 54 13.8	1 37 3.3	−1 47.3	+3 13 26.5	−1 47.5	9.8575568	0.1147780	0.1104617
5	190 22 9.4	1 36 54.3	2 17.2	3 5 3.8	2 23.5	9.8578373	0.1060531	0.1015520
9	196 49 27.0	1 36 44.4	2 40.1	2 54 21.2	2 57.4	9.8581363	0.0969567	0.0922657
13	203 16 3.7	1 36 33.9	2 54.9	2 41 27.4	3 29.0	9.8584499	0.0874774	0.0825893
17	209 41 57.4	1 36 23.0	3 0.8	2 26 32.8	3 57.8	9.8587741	0.0776002	0.0725077
21	216 7 7.3	1 36 11.9	−2 57.8	+2 9 49.3	−4 23.4	9.8591048	0.0673102	0.0620063
25	222 31 33.0	1 36 0.9	2 45.9	1 51 30.1	4 45.6	9.8594378	0.0565951	0.0510750
29	228 55 15.1	1 35 50.2	2 25.7	1 31 49.2	5 4.2	9.8597690	0.0454456	0.0397060
Aug. 2	235 18 15.2	1 35 40.0	1 58.3	1 11 1.7	5 18.9	9.8600942	0.0338551	0.0278915
6	241 40 35.6	1 35 30.4	1 25.1	0 49 23.4	5 29.6	9.8604094	0.0218136	0.0156190
10	248 2 19.3	1 35 21.6	−0 47.9	+0 27 10.4	−5 36.2	9.8607108	0.0093049	0.0028680
14	254 23 29.7	1 35 13.8	−0 8.3	+0 4 39.1	5 38.7	9.8609948	9.9963053	9.9896132
18	260 44 10.9	1 35 7.0	+0 31.7	−0 17 53.8	5 37.1	9.8612577	9.9827880	9.9758267
22	267 4 27.3	1 35 1.3	1 10.0	0 40 12.1	5 31.4	9.8614968	9.9687260	9.9614833
26	273 24 23.4	1 34 56.8	1 44.9	1 1 59.6	5 21.7	9.8617088	9.9540960	9.9465615
30	279 44 3.8	1 34 53.5	+2 14.7	−1 23 0.6	−5 8.2	9.8618913	9.9388776	9.9310412
Sept. 3	286 3 33.3	1 34 51.4	2 37.9	1 43 0.0	4 50.9	9.8620422	9.9230490	9.9148974
7	292 22 56.5	1 34 50.3	2 53.4	2 1 43.5	4 30.2	9.8621598	9.9065819	9.8980969
11	298 42 17.4	1 34 50.3	3 0.6	2 18 57.7	4 6.3	9.8622427	9.8894374	9.8805971
15	305 1 40.4	1 34 51.3	2 58.9	2 34 30.3	3 39.5	9.8622899	9.8715695	9.8623485
19	311 21 9.1	1 34 53.2	+2 48.5	−2 48 10.2	−3 10.0	9.8623008	9.8529278	9.8433020
23	317 40 46.7	1 34 55.8	2 30.0	2 59 47.4	2 38.2	9.8622753	9.8334692	9.8234205
27	324 0 36.1	1 34 59.1	2 4.2	3 9 13.5	2 4.5	9.8622136	9.8131535	9.8026636
Oct. 1	330 20 39.9	1 35 3.0	1 32.4	3 16 21.5	1 29.2	9.8621167	9.7919464	9.7809982
5	336 41 0.3	1 35 7.3	0 55.9	3 21 6.0	0 52.8	9.8619854	9.7698144	9.7583895
9	343 1 38.9	1 35 12.2	+0 16.8	−3 23 23.4	−0 15.7	9.8618216	9.7467189	9.7347966
13	349 22 37.1	1 35 17.1	−0 23.2	3 23 11.6	+0 21.7	9.8616271	9.7226187	9.7101824
17	355 43 56.1	1 35 22.5	1 2.0	3 20 30.3	0 58.9	9.8614041	9.6974861	9.6845311
21	2 5 37.1	1 35 28.0	1 37.9	3 15 21.2	1 35.6	9.8611554	9.6713224	9.6578695
25	8 27 40.7	1 35 33.8	2 9.1	3 7 47.3	2 11.2	9.8608839	9.6441850	9.6302872
29	14 50 7.6	1 35 39.7	−2 33.8	−2 57 54.0	+2 45.2	9.8605929	9.6162011	9.6019591
Nov. 2	21 12 58.6	1 35 45.8	2 51.0	2 45 47.8	3 17.5	9.8602859	9.5875997	9.5731690
6	27 36 14.4	1 35 52.1	2 59.9	2 31 37.4	3 47.4	9.8599667	9.5587249	9.5443378
10	33 59 55.6	1 35 58.6	2 59.8	2 15 32.6	4 14.6	9.8596393	9.5300913	9.5160858
14	40 24 2.9	1 36 5.2	2 50.7	1 57 45.1	4 38.7	9.8593077	9.5024412	9.4892948
18	46 48 37.0	1 36 11.9	−2 33.2	−1 38 27.7	+4 59.4	9.8589760	9.4768065	9.4651529
22	53 13 38.4	1 36 18.9	2 7.9	1 17 54.7	5 16.5	9.8586485	9.4545248	9.4451221
26	59 39 8.0	1 36 26.0	1 36.2	0 56 21.2	5 29.6	9.8583293	9.4371406	9.4307628
30	66 5 6.3	1 36 33.2	0 59.7	0 34 3.2	5 38.7	9.8580225	9.4261452	9.4234052
Dec. 4	72 31 33.3	1 36 40.4	−0 20.0	−0 11 17.6	5 43.4	9.8577319	9.4226124	9.4237856
8	78 58 29.4	1 36 47.6	+0 20.6	+0 11 38.3	+5 43.8	9.8574614	9.4268873	9.4318321
12	85 25 54.3	1 36 54.8	1 0.4	0 34 27.0	5 39.8	9.8572144	9.4384935	9.4467140
16	91 53 47.2	1 37 1.7	1 37.0	0 56 50.9	5 31.4	9.8569943	9.4563148	9.4671084
20	98 22 7.0	1 37 8.2	2 8.8	1 18 32.6	5 18.7	9.8568038	9.4789060	9.4915239
24	104 50 52.2	1 37 14.3	2 34.0	1 39 15.2	5 1.9	9.8566456	9.5047910	9.5185504
28	111 20 0.4	1 37 19.7	+2 51.4	+1 58 42.6	+4 41.1	9.8565215	9.5326612	9.5470009
32	117 49 28.7	1 37 24.4	+3 0.1	+2 16 39.2	+4 16.6	9.8564333	9.5614632	9.5759595

MARS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	″			
Jan. 2	176 32 15.8	26 36.55	−52.2	+1 27 41.7	−31.63	0.2182404	0.2255722	0.2204836
6	178 18 49.8	26 40.46	53.0	1 25 32.5	32.95	0.2176962	0.2153092	0.2100472
10	180 5 40.0	26 44.71	53.5	1 23 18.1	34.25	0.2171123	0.2046969	0.1992559
14	181 52 47.9	26 49.29	53.8	1 20 58.5	35.55	0.2164891	0.1937233	0.1880977
18	183 40 14.7	26 54.15	53.9	1 18 33.7	36.82	0.2158271	0.1823789	0.1765657
22	185 28 1.5	26 59.31	−53.8	+1 16 3.9	−38.09	0.2151263	0.1706586	0.1646570
26	187 16 9.6	27 4.81	53.5	1 13 29.0	39.34	0.2143873	0.1585606	0.1523696
30	189 4 40.4	27 10.59	53.0	1 10 49.2	40.53	0.2136104	0.1460835	0.1397016
Feb. 3	190 53 34.7	27 16.65	52.2	1 8 4.6	41.75	0.2127962	0.1332227	0.1266449
7	192 42 54.0	27 23.01	51.2	1 5 15.2	42.92	0.2119450	0.1199667	0.1131869
11	194 32 39.2	27 29.66	−50.1	+1 2 21.2	−44.09	0.2110575	0.1063043	0.0993172
15	196 22 51.7	27 36.64	48.7	0 59 22.5	45.21	0.2101341	0.0922254	0.0850288
19	198 13 32.7	27 43.94	47.1	0 56 19.5	46.30	0.2091753	0.0777280	0.0703236
23	200 4 43.6	27 51.50	45.4	0 53 12.1	47.39	0.2081820	0.0628160	0.0552056
27	201 56 25.1	27 59.35	43.4	0 50 0.4	48.42	0.2071547	0.0474932	0.0396794
Mar. 3	203 48 38.8	28 7.52	−41.2	+0 46 44.7	−49.44	0.2060941	0.0317635	0.0237451
7	205 41 25.7	28 16.00	38.8	0 43 24.9	50.41	0.2050008	0.0156241	0.0074012
11	207 34 47.2	28 24.80	36.3	0 40 1.4	51.36	0.2038758	9.9990753	9.9906481
15	209 28 44.5	28 33.86	33.5	0 36 34.0	52.27	0.2027200	9.9821206	9.9734960
19	211 23 18.5	28 43.17	30.7	0 33 3.2	53.12	0.2015343	9.9647779	9.9559695
23	213 18 30.3	28 52.79	−27.6	+0 29 29.0	−53.96	0.2003192	9.9470773	9.9381056
27	215 14 21.2	29 2.74	24.4	0 25 51.5	54.74	0.1990760	9.9290600	9.9199468
31	217 10 52.6	29 12.92	21.1	0 22 11.1	55.47	0.1978059	9.9107717	9.9015398
Apr. 4	219 8 5.0	29 23.36	17.6	0 18 27.7	56.17	0.1965097	9.8922588	9.8829366
8	221 5 59.9	29 34.14	14.1	0 14 41.7	56.80	0.1951890	9.8735814	9.8642045
12	223 4 38.5	29 45.12	−10.5	+0 10 53.3	−57.37	0.1938447	9.8548184	9.8454389
16	225 4 1.3	29 56.35	6.8	0 7 2.7	57.90	0.1924781	9.8360822	9.8267675
20	227 4 9.7	30 7.87	− 3.1	+0 3 10.1	58.37	0.1910904	9.8175155	9.8083513
24	229 5 4.7	30 19.64	+ 0.7	−0 0 44.3	58.77	0.1896831	9.7992967	9.7903763
28	231 6 47.1	30 31.61	4.5	0 4 40.1	59.10	0.1882579	9.7816161	9.7730422
May 2	233 9 17.9	30 43.81	+ 8.3	−0 8 37.1	−59.37	0.1868163	9.7646830	9.7565688
6	235 12 37.9	30 56.24	12.1	0 12 35.1	59.57	0.1853600	9.7487278	9.7411945
10	237 16 48.1	31 8.85	15.9	0 16 33.7	59.69	0.1838904	9.7340044	9.7271908
14	239 21 49.0	31 21.67	19.6	0 20 32.6	59.72	0.1824093	9.7207928	9.7148450
18	241 27 41.8	31 34.69	23.2	0 24 31.5	59.67	0.1809188	9.7093821	9.7044349
22	243 34 26.8	31 47.81	+26.7	−0 28 30.0	−59.55	0.1794206	9.7000307	9.6961931
26	245 42 4.5	32 1.11	30.2	0 32 27.9	59.34	0.1779165	9.6929387	9.6902818
30	247 50 35.9	32 14.55	33.4	0 36 24.7	59.02	0.1764090	9.6882290	9.6867824
June 3	250 0 1.1	32 28.09	36.5	0 40 20.1	58.61	0.1749000	9.6859418	9.6857005
7	252 10 20.8	32 41.74	39.4	0 44 13.6	58.10	0.1733915	9.6860502	9.6869789
11	254 21 35.1	32 55.43	+42.1	−0 48 4.9	−57.50	0.1718861	9.6884692	9.6905008
15	256 33 44.3	33 9.19	44.6	0 51 53.5	56.79	0.1703860	9.6930476	9.6960836
19	258 46 48.7	33 23.01	46.8	0 55 39.2	55.97	0.1688934	9.6995752	9.7034873
23	261 0 48.4	33 36.80	48.7	0 59 21.3	55.02	0.1674110	9.7077856	9.7124347
27	263 15 43.1	33 50.56	50.3	1 2 59.4	53.99	0.1659411	9.7173978	9.7226416
July 1	265 31 32.8	34 4.27	+51.7	−1 6 33.2	−52.84	0.1644866	9.7281345	9.7338473
5	267 48 17.2	34 17.92	+52.8	−1 10 2.1	−51.55	0.1630496	9.7397543	9.7456295

MARS.

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							At Date.	At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	″			
July 1	265 31 32.8	34 4.27	+51.7	−1 6 33.2	−52.84	0.1644866	9.7281345	9.7338473
5	267 48 17.2	34 17.92	52.8	1 10 2.1	51.55	0.1630496	9.7397543	9.7458295
9	270 5 56.1	34 31.49	53.5	1 13 25.6	50.15	0.1616332	9.7520513	9.7583982
13	272 24 28.9	34 44.92	53.9	1 16 43.3	48.65	0.1602398	9.7648496	9.7713846
17	274 43 55.3	34 58.19	53.9	1 19 54.8	47.02	0.1588724	9.7779864	9.7846362
21	277 4 14.2	35 11.25	+53.5	−1 22 59.5	−45.26	0.1575332	9.7913185	9.7980174
25	279 25 25.0	35 24.11	52.8	1 25 56.9	43.40	0.1562251	9.8047202	9.8114168
29	281 47 26.8	35 36.70	51.7	1 28 46.7	41.41	0.1549513	9.8180962	9.8247523
Aug. 2	284 10 18.2	35 49.00	50.3	1 31 28.2	39.30	0.1537141	9.8313799	9.8379739
6	286 33 58.4	36 0.99	48.5	1 34 1.1	37.10	0.1525164	9.8445319	9.8510499
10	288 58 25.6	36 12.59	+46.4	−1 36 25.0	−34.77	0.1513609	9.8575257	9.8639546
14	291 23 38.6	36 23.82	43.9	1 38 39.3	32.32	0.1502496	9.8703339	9.8766617
18	293 49 35.6	36 34.59	41.1	1 40 43.6	29.77	0.1491862	9.8829337	9.8891471
22	296 16 14.7	36 44.92	38.1	1 42 37.5	27.15	0.1481726	9.8953002	9.9013920
26	298 43 34.4	36 54.79	34.6	1 44 20.8	24.42	0.1472111	9.9074210	9.9133892
30	301 11 32.4	37 4.12	+30.9	−1 45 52.9	−21.59	0.1463045	9.9192970	9.9251451
Sept. 3	303 40 6.8	37 12.90	26.9	1 47 13.5	18.67	0.1454547	9.9309371	9.9366738
7	306 9 14.9	37 21.06	22.8	1 48 22.3	15.70	0.1446642	9.9423571	9.9479864
11	308 38 54.6	37 28.67	18.5	1 49 19.1	12.66	0.1439347	9.9535638	9.9590887
15	311 9 3.5	37 35.60	14.0	1 50 3.6	9.56	0.1432683	9.9645614	9.9699812
19	313 39 38.6	37 41.87	+ 9.5	−1 50 35.6	− 6.42	0.1426669	9.9753482	9.9806644
23	316 10 37.6	37 47.47	+ 4.8	1 50 55.0	− 3.22	0.1421318	9.9859288	9.9911433
27	318 41 57.5	37 52.34	0.0	1 51 1.4	0.00	0.1416648	9.9963103	0.0014316
Oct. 1	321 13 35.4	37 56.50	− 4.7	1 50 55.0	+ 3.22	0.1412670	0.0065090	0.0115451
5	323 45 28.6	37 59.94	9.5	1 50 35.6	6.47	0.1409392	0.0165417	0.0215007
9	326 17 33.9	38 2.64	−14.1	−1 50 3.2	+ 9.72	0.1406829	0.0264222	0.0313065
13	328 49 48.7	38 4.57	18.6	1 49 17.8	12.95	0.1404984	0.0361541	0.0409650
17	331 22 9.5	38 5.69	23.0	1 48 19.6	16.15	0.1403864	0.0457391	0.0504765
21	333 54 33.2	38 6.06	27.2	1 47 8.6	19.35	0.1403467	0.0551784	0.0598450
25	336 26 57.0	38 5.65	31.3	1 45 44.8	22.49	0.1403801	0.0644781	0.0690787
29	338 59 17.4	38 4.47	−35.0	−1 44 8.7	+25.54	0.1404862	0.0736484	0.0781892
Nov. 2	341 31 31.8	38 2.57	38.6	1 42 20.5	28.55	0.1406649	0.0827025	0.0871890
6	344 3 37.0	37 59.89	41.7	1 40 20.3	31.50	0.1409154	0.0916494	0.0960839
10	346 35 29.9	37 56.41	44.6	1 38 8.5	34.35	0.1412372	0.1004923	0.1048744
14	349 7 7.3	37 52.17	47.1	1 35 45.5	37.11	0.1416293	0.1092298	0.1135577
18	351 38 26.3	37 47.26	−49.1	−1 33 11.6	+39.77	0.1420905	0.1178588	0.1221326
22	354 9 24.4	37 41.67	50.9	1 30 27.3	42.32	0.1426196	0.1263797	0.1306011
26	356 39 58.7	37 35.36	52.3	1 27 33.0	44.76	0.1432155	0.1347979	0.1389714
30	359 10 6.3	37 28.40	53.2	1 24 29.2	47.09	0.1438764	0.1431217	0.1472498
Dec. 4	1 39 45.0	37 20.79	53.8	1 21 16.3	49.29	0.1446005	0.1513558	0.1554399
8	4 8 52.1	37 12.57	−53.9	−1 17 54.9	+51.34	0.1453858	0.1595015	0.1635404
12	6 37 24.9	37 3.82	53.6	1 14 25.6	53.26	0.1462305	0.1675555	0.1715452
16	9 5 21.9	36 54.52	53.0	1 10 48.8	55.06	0.1471323	0.1755099	0.1794495
20	11 32 40.4	36 44.70	51.9	1 7 5.1	56.71	0.1480886	0.1833633	0.1872521
24	13 59 18.8	36 34.39	50.4	1 3 15.1	58.22	0.1490976	0.1911159	0.1949560
28	16 25 14.8	36 23.63	−48.6	−0 59 19.3	+59.60	0.1501567	0.1987725	0.2025658
32	18 50 27.1	36 12.46	−46.6	−0 55 18.3	+60.82	0.1512632	0.2063358	

JUPITER.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	″			
Jan. 2	289 20 45.2	5 3.74	+ 9.3	−0 13 45.4	−6.83	0.7126661	0.7879445	0.7881026
6	289 41 0.5	5 3.91	9.6	0 14 12.7	6.83	0.7125426	0.7882005	0.7882380
10	290 1 16.5	5 4.09	9.9	0 14 40.0	6.83	0.7124191	0.7882154	0.7881322
14	290 21 33.2	5 4.26	10.2	0 15 7.3	6.82	0.7122957	0.7879885	0.7877839
18	290 41 50.6	5 4.43	10.5	0 15 34.6	6.82	0.7121723	0.7875185	0.7871922
22	291 2 8.7	5 4.60	+10.8	−0 16 1.9	−6.82	0.7120490	0.7868050	0.7863568
26	291 22 27.4	5 4.78	11.1	0 16 29.2	6.81	0.7119257	0.7858481	0.7852794
30	291 42 46.9	5 4.95	11.4	0 16 56.4	6.81	0.7118025	0.7846509	0.7839630
Feb. 3	292 3 7.1	5 5.13	11.7	0 17 23.6	6.80	0.7116794	0.7832157	0.7824095
7	292 23 27.9	5 5.30	12.0	0 17 50.8	6.79	0.7115564	0.7815444	0.7806208
11	292 43 49.5	5 5.47	+12.3	−0 18 17.9	−6.78	0.7114335	0.7796387	0.7785979
15	293 4 11.7	5 5.65	12.6	0 18 45.1	6.78	0.7113106	0.7774987	0.7763413
19	293 24 34.6	5 5.82	12.8	0 19 12.2	6.77	0.7111878	0.7751262	0.7738536
23	293 44 58.3	5 5.99	13.1	0 19 39.3	6.77	0.7110651	0.7725242	0.7711385
27	294 5 22.6	5 6.17	13.4	0 20 6.3	6.76	0.7109425	0.7696971	0.7682007
Mar. 3	294 25 47.6	5 6.34	+13.7	−0 20 33.4	−6.76	0.7108200	0.7666499	0.7650452
7	294 46 13.3	5 6.51	14.0	0 21 0.4	6.75	0.7106975	0.7633876	0.7616769
11	295 6 39.7	5 6.68	14.2	0 21 27.4	6.74	0.7105751	0.7599137	0.7580984
15	295 27 6.8	5 6.86	14.5	0 21 54.3	6.73	0.7104529	0.7562318	0.7543144
19	295 47 34.6	5 7.03	14.8	0 22 21.2	6.72	0.7103308	0.7523471	0.7503305
23	296 8 3.0	5 7.20	+15.0	−0 22 48.1	−6.72	0.7102089	0.7482657	0.7461537
27	296 28 32.2	5 7.38	15.3	0 23 15.0	6.71	0.7100872	0.7439958	0.7417933
31	296 49 2.0	5 7.55	15.6	0 23 41.8	6.70	0.7099655	0.7395473	0.7372587
Apr. 4	297 9 32.6	5 7.72	15.8	0 24 8.6	6.69	0.7098441	0.7349287	0.7325585
8	297 30 3.8	5 7.89	16.1	0 24 35.3	6.68	0.7097228	0.7301491	0.7277016
12	297 50 35.7	5 8.07	+16.4	−0 25 2.0	−6.67	0.7096016	0.7252173	0.7226975
16	298 11 8.3	5 8.24	16.7	0 25 28.7	6.66	0.7094808	0.7201439	0.7175581
20	298 31 41.6	5 8.41	16.9	0 25 55.3	6.65	0.7093601	0.7149420	0.7122976
24	298 52 15.6	5 8.58	17.1	0 26 21.9	6.64	0.7092397	0.7096271	0.7069327
28	299 12 50.2	5 8.75	17.4	0 26 48.5	6.63	0.7091195	0.7042165	0.7014805
May 2	299 33 25.6	5 8.92	+17.6	−0 27 15.0	−6.62	0.7089994	0.6987271	0.6959583
6	299 54 1.6	5 9.09	17.9	0 27 41.4	6.61	0.7088796	0.6931765	0.6903838
10	300 14 38.3	5 9.26	18.1	0 28 7.8	6.60	0.7087600	0.6875828	0.6847758
14	300 35 15.7	5 9.44	18.4	0 28 34.2	6.59	0.7086407	0.6819664	0.6791571
18	300 55 53.8	5 9.61	18.6	0 29 0.5	6.58	0.7085215	0.6763516	0.6735531
22	301 16 32.6	5 9.78	+18.8	−0 29 26.8	−6.57	0.7084025	0.6707652	0.6679915
26	301 37 12.0	5 9.95	19.1	0 29 53.1	6.55	0.7082838	0.6652356	0.6625012
30	301 57 52.2	5 10.12	19.3	0 30 19.2	6.54	0.7081653	0.6597917	0.6571108
June 3	302 18 33.0	5 10.29	19.5	0 30 45.3	6.52	0.7080471	0.6544620	0.6518490
7	302 39 14.5	5 10.46	19.7	0 31 11.4	6.51	0.7079290	0.6492758	0.6467463
11	302 59 56.6	5 10.62	+20.0	−0 31 37.4	−6.49	0.7078112	0.6442649	0.6418359
15	303 20 39.5	5 10.79	20.2	0 32 3.4	6.48	0.7076937	0.6394638	0.6371533
19	303 41 23.0	5 10.96	20.4	0 32 29.3	6.47	0.7075763	0.6349087	0.6327348
23	304 2 7.2	5 11.13	20.6	0 32 55.1	6.45	0.7074592	0.6306354	0.6286152
27	304 22 52.0	5 11.30	20.8	0 33 20.9	6.44	0.7073423	0.6266779	0.6248272
July 1	304 43 37.6	5 11.47	+21.1	−0 33 46.7	−6.42	0.7072257	0.6230667	0.6214003
5	305 4 23.8	5 11.64	+21.3	−0 34 12.4	−6.41	0.7071091	0.6198315	0.6183639

JUPITER.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	″			
July 1	304 43 37.6	5 11.47	+21.1	−0 33 46.7	−6.42	0.7072257	0.6230667	0.6214003
5	305 4 23.8	5 11.64	21.3	0 34 12.4	6.41	0.7071091	0.6198315	0.6183639
9	305 25 10.7	5 11.81	21.5	0 34 38.0	6.39	0.7069928	0.6170009	0.6157462
13	305 45 58.3	5 11.97	21.7	0 35 3.5	6.37	0.7068768	0.6146028	0.6135743
17	306 6 46.5	5 12.14	21.8	0 35 29.0	6.36	0.7067611	0.6126630	0.6118717
21	306 27 35.4	5 12.31	+22.0	−0 35 54.4	−6.34	0.7066456	0.6112018	0.6106555
25	306 48 24.9	5 12.47	22.2	0 36 19.7	6.32	0.7065304	0.6102334	0.6099369
29	307 9 15.2	5 12.64	22.4	0 36 45.0	6.31	0.7064155	0.6097658	0.6097207
Aug. 2	307 30 6.1	5 12.80	22.6	0 37 10.2	6.29	0.7063008	0.6098013	0.6100079
6	307 50 57.6	5 12.97	22.8	0 37 35.4	6.27	0.7061864	0.6103397	0.6107964
10	308 11 49.8	5 13.14	+23.0	−0 38 0.5	−6.26	0.7060723	0.6113767	0.6120800
14	308 32 42.7	5 13.30	23.1	0 38 25.5	6.24	0.7059586	0.6129041	0.6138474
18	308 53 36.3	5 13.46	23.3	0 38 50.4	6.22	0.7058452	0.6149069	0.6160800
22	309 14 30.4	5 13.63	23.5	0 39 15.3	6.20	0.7057321	0.6173634	0.6187540
26	309 35 25.3	5 13.80	23.6	0 39 40.1	6.18	0.7056194	0.6202478	0.6218413
30	309 56 20.8	5 13.96	+23.8	−0 40 4.8	−6.16	0.7055070	0.6235306	0.6253121
Sept. 3	310 17 16.9	5 14.12	23.9	0 40 29.4	6.14	0.7053949	0.6271820	0.6291366
7	310 38 13.7	5 14.28	24.1	0 40 54.0	6.12	0.7052831	0.6311717	0.6332833
11	310 59 11.1	5 14.44	24.3	0 41 18.5	6.11	0.7051717	0.6354673	0.6377199
15	311 20 9.3	5 14.61	24.4	0 41 42.9	6.09	0.7050606	0.6400362	0.6424113
19	311 41 8.0	5 14.77	+24.6	−0 42 7.2	−6.07	0.7049498	0.6448407	0.6473195
23	312 2 7.5	5 14.93	24.7	0 42 31.5	6.05	0.7048393	0.6498435	0.6524083
27	312 23 7.5	5 15.09	24.8	0 42 55.6	6.03	0.7047292	0.6550099	0.6576438
Oct. 1	312 44 8.2	5 15.25	24.9	0 43 19.7	6.01	0.7046194	0.6603067	0.6629949
5	313 5 9.5	5 15.41	25.1	0 43 43.7	5.98	0.7045100	0.6657046	0.6684320
9	313 26 11.5	5 15.57	+25.2	−0 44 7.6	−5.96	0.7044010	0.6711737	0.6739262
13	313 47 14.1	5 15.73	25.3	0 44 31.4	5.94	0.7042923	0.6766858	0.6794488
17	314 8 17.3	5 15.89	25.4	0 44 55.1	5.92	0.7041841	0.6822119	0.6849713
21	314 29 21.2	5 16.05	25.6	0 45 18.8	5.89	0.7040762	0.6877242	0.6904674
25	314 50 25.7	5 16.21	25.7	0 45 42.3	5.87	0.7039686	0.6931984	0.6959144
29	315 11 30.9	5 16.36	+25.8	−0 46 5.8	−5.85	0.7038615	0.6986132	0.7012926
Nov. 2	315 32 36.6	5 16.52	25.9	0 46 29.1	5.82	0.7037548	0.7039504	0.7065846
6	315 53 43.0	5 16.67	26.0	0 46 52.4	5.80	0.7036485	0.7091930	0.7117733
10	316 14 50.0	5 16.82	26.1	0 47 15.6	5.78	0.7035426	0.7143234	0.7168413
14	316 35 57.6	5 16.98	26.2	0 47 38.7	5.75	0.7034372	0.7193250	0.7217724
18	316 57 5.8	5 17.13	+26.3	−0 48 1.6	−5.73	0.7033322	0.7241820	0.7265521
22	317 18 14.6	5 17.29	26.3	0 48 24.5	5.70	0.7032277	0.7288812	0.7311681
26	317 39 24.1	5 17.44	26.4	0 48 47.3	5.68	0.7031235	0.7334118	0.7356112
30	318 0 34.2	5 17.59	26.5	0 49 10.0	5.66	0.7030198	0.7377653	0.7398732
Dec. 4	318 21 44.8	5 17.75	26.6	0 49 32.6	5.63	0.7029165	0.7419338	0.7439461
8	318 42 56.1	5 17.90	+26.6	−0 49 55.0	−5.61	0.7028137	0.7459090	0.7478213
12	319 4 8.1	5 18.05	26.7	0 50 17.4	5.58	0.7027114	0.7496820	0.7514899
16	319 25 20.6	5 18.20	26.7	0 50 39.7	5.55	0.7026095	0.7532444	0.7549448
20	319 46 33.7	5 18.35	26.8	0 51 1.9	5.53	0.7025081	0.7565905	0.7581812
24	320 7 47.4	5 18.50	26.8	0 51 24.0	5.50	0.7024072	0.7597164	0.7611957
28	320 29 1.7	5 18.65	+26.9	−0 51 45.9	−5.48	0.7023067	0.7626186	0.7639855
32	320 50 16.6	5 18.80	+26.9	−0 52 7.8	−5.45	0.7022067	0.7652953	

SATURN.

GREENWICH MEAN NOON.

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	° ′ ″	′ ″	′ ″	° ′ ″	″			
Jan. 2	148 48 24.1	2 8.18	+1 33.0	+1 28 4.3	+4.50	0.9656998	0.9343048	0.9330146
6	148 56 56.8	2 8.15	1 33.1	1 28 22.5	4.49	0.9657476	0.9317612	0.9305463
10	149 5 29.3	2 8.13	1 33.3	1 28 40.4	4.48	0.9657956	0.9293722	0.9282409
14	149 14 1.8	2 8.11	1 33.4	1 28 58.3	4.48	0.9658436	0.9271546	0.9261154
18	149 22 34.2	2 8.08	1 33.6	1 29 16.2	4.47	0.9658916	0.9251252	0.9241864
22	149 31 6.5	2 8.05	+1 33.7	+1 29 34.1	+4.46	0.9659397	0.9233004	0.9224694
26	149 39 38.6	2 8.01	1 33.9	1 29 51.9	4.45	0.9659878	0.9216946	0.9209777
30	149 48 10.6	2 7.98	1 34.0	1 30 9.7	4.44	0.9660361	0.9203198	0.9197227
Feb. 3	149 56 42.5	2 7.95	1 34.1	1 30 27.4	4.43	0.9660844	0.9191868	0.9187130
7	150 5 14.3	2 7.93	1 34.2	1 30 45.1	4.42	0.9661328	0.9183023	0.9179557
11	150 13 46.0	2 7.90	+1 34.4	+1 31 2.8	+4.41	0.9661812	0.9176737	0.9174573
15	150 22 17.5	2 7.87	1 34.5	1 31 20.4	4.40	0.9662298	0.9173066	0.9172224
19	150 30 48.9	2 7.84	1 34.6	1 31 38.0	4.39	0.9662783	0.9172047	0.9172538
23	150 39 20.2	2 7.81	1 34.7	1 31 55.5	4.38	0.9663270	0.9173692	0.9175506
27	150 47 51.4	2 7.78	1 34.8	1 32 13.0	4.37	0.9663758	0.9177975	0.9181093
Mar. 3	150 56 22.5	2 7.75	+1 34.9	+1 32 30.5	+4.36	0.9664246	0.9184850	0.9189237
7	151 4 53.5	2 7.73	1 35.0	1 32 47.9	4.35	0.9664736	0.9194244	0.9199863
11	151 13 24.4	2 7.70	1 35.2	1 33 5.3	4.34	0.9665225	0.9206081	0.9212889
15	151 21 55.1	2 7.67	1 35.3	1 33 22.7	4.33	0.9665715	0.9220273	0.9228222
19	151 30 25.7	2 7.64	1 35.4	1 33 40.0	4.32	0.9666206	0.9236716	0.9245743
23	151 38 56.3	2 7.61	+1 35.5	+1 33 57.3	+4.32	0.9666697	0.9255283	0.9265318
27	151 47 26.7	2 7.58	1 35.6	1 34 14.5	4.31	0.9667189	0.9275827	0.9286791
31	151 55 57.0	2 7.55	1 35.7	1 34 31.7	4.30	0.9667682	0.9298187	0.9309995
Apr. 4	152 4 27.1	2 7.52	1 35.8	1 34 48.9	4.29	0.9668175	0.9322196	0.9334770
8	152 12 57.2	2 7.50	1 35.9	1 35 6.0	4.28	0.9668669	0.9347696	0.9360954
12	152 21 27.2	2 7.47	+1 36.0	+1 35 23.1	+4.27	0.9669164	0.9374525	0.9388388
16	152 29 57.0	2 7.44	1 36.1	1 35 40.2	4.26	0.9669660	0.9402524	0.9416910
20	152 38 26.7	2 7.41	1 36.2	1 35 57.2	4.25	0.9670156	0.9431525	0.9446344
24	152 46 56.3	2 7.38	1 36.3	1 36 14.2	4.24	0.9670653	0.9461349	0.9476514
28	152 55 25.8	2 7.35	1 36.4	1 36 31.1	4.23	0.9671150	0.9491820	0.9507245
May 2	153 3 55.2	2 7.32	+1 36.4	+1 36 48.0	+4.22	0.9671647	0.9522773	0.9538382
6	153 12 24.4	2 7.29	1 36.5	1 37 4.8	4.21	0.9672145	0.9554055	0.9569775
10	153 20 53.5	2 7.26	1 36.6	1 37 21.6	4.20	0.9672644	0.9585525	0.9601287
14	153 29 22.5	2 7.23	1 36.6	1 37 38.4	4.19	0.9673144	0.9617044	0.9632779
18	153 37 51.4	2 7.20	1 36.7	1 37 55.1	4.18	0.9673644	0.9648475	0.9664113
22	153 46 20.1	2 7.17	+1 36.8	+1 38 11.8	+4.17	0.9674145	0.9679678	0.9695152
26	153 54 48.8	2 7.15	1 36.8	1 38 28.5	4.16	0.9674647	0.9710521	0.9725767
30	154 3 17.4	2 7.12	1 36.9	1 38 45.1	4.15	0.9675149	0.9740880	0.9755846
June 3	154 11 45.8	2 7.09	1 37.0	1 39 1.7	4.14	0.9675652	0.9770654	0.9785291
7	154 20 14.1	2 7.06	1 37.0	1 39 18.2	4.13	0.9676155	0.9799748	0.9814013
11	154 28 42.3	2 7.03	+1 37.1	+1 39 34.7	+4.12	0.9676658	0.9828075	0.9841922
15	154 37 10.4	2 7.00	1 37.1	1 39 51.2	4.11	0.9677163	0.9855543	0.9868923
19	154 45 38.4	2 6.97	1 37.2	1 40 7.6	4.10	0.9677667	0.9882056	0.9894932
23	154 54 6.2	2 6.94	1 37.2	1 40 24.0	4.09	0.9678173	0.9907543	0.9919877
27	155 2 33.9	2 6.91	1 37.3	1 40 40.3	4.08	0.9678679	0.9931926	0.9943680
July 1	155 11 1.5	2 6.88	+1 37.3	+1 40 56.6	+4.07	0.9679185	0.9955137	0.9966291
5	155 19 29.0	2 6.85	+1 37.3	+1 41 12.9	+4.06	0.9679693	0.9977135	0.9987662

SATURN.

GREENWICH MEAN NOON.

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							At Date.	At Intermediate Date.
	° ′ ″	′ ″	′ ″	° ′ ″	″			
July 1	155 11 1.5	2 6.88	+1 37.3	+1 40 56.6	+4.07	0.9679185	0.9955137	0.9966291
5	155 19 29.0	2 6.85	1 37.3	1 41 12.9	4.06	0.9679693	0.9977135	0.9987662
9	155 27 56.4	2 6.82	1 37.4	1 41 29.1	4.05	0.9680201	0.9997866	1.0007741
13	155 36 23.7	2 6.79	1 37.4	1 41 45.2	4.04	0.9680709	1.0017278	1.0026473
17	155 44 50.8	2 6.76	1 37.4	1 42 1.4	4.03	0.9681219	1.0035319	1.0043809
21	155 53 17.8	2 6.73	+1 37.4	+1 42 17.5	+4.02	0.9681727	1.0051938	1.0059702
25	156 1 44.7	2 6.70	1 37.5	1 42 33.5	4.01	0.9682238	1.0007096	1.0074120
29	156 10 11.4	2 6.67	1 37.5	1 42 49.5	4.00	0.9682748	1.0080769	1.0087041
Aug. 2	156 18 38.1	2 6.65	1 37.5	1 43 5.5	3.99	0.9683260	1.0092935	1.0098444
6	156 27 4.6	2 6.62	1 37.5	1 43 21.4	3.98	0.9683772	1.0103567	1.0108300
10	156 35 31.0	2 6.59	+1 37.5	+1 43 37.3	+3.97	0.9684283	1.0112642	1.0116586
14	156 43 55.3	2 6.56	1 37.5	1 43 53.1	3.96	0.9684796	1.0120132	1.0123272
18	156 52 23.5	2 6.53	1 37.6	1 44 8.9	3.95	0.9685309	1.0126008	1.0128337
22	157 0 49.6	2 6.50	1 37.6	1 44 24.7	3.93	0.9685824	1.0130259	1.0131774
26	157 9 15.5	2 6.47	1 37.6	1 44 40.4	3.92	0.9686337	1.0132879	1.0133577
30	157 17 41.3	2 6.44	+1 37.6	+1 44 56.1	+3.91	0.9686852	1.0133868	1.0133752
Sept. 3	157 26 7.0	2 6.41	1 37.6	1 45 11.7	3.90	0.9687367	1.0133228	1.0132294
7	157 34 32.6	2 6.38	1 37.6	1 45 27.3	3.89	0.9687883	1.0130949	1.0129192
11	157 42 58.0	2 6.35	1 37.7	1 45 42.9	3.88	0.9688400	1.0127023	1.0124443
15	157 51 23.4	2 6.32	1 37.7	1 45 58.4	3.87	0.9688916	1.0121451	1.0118047
19	157 59 48.6	2 6.29	+1 37.7	+1 46 13.9	+3.86	0.9689434	1.0114236	1.0110019
23	158 8 13.7	2 6.96	1 37.7	1 46 29.3	3.85	0.9689951	1.0105401	1.0100381
27	158 16 38.6	2 6.23	1 37.7	1 46 44.7	3.84	0.9690470	1.0094965	1.0089155
Oct. 1	158 25 3.5	2 6.20	1 37.6	1 47 0.0	3.83	0.9690990	1.0082954	1.0076364
5	158 33 28.2	2 6.17	1 37.6	1 47 15.3	3.82	0.9691509	1.0069385	1.0062022
9	158 41 52.8	2 6.14	+1 37.6	+1 47 30.6	+3.81	0.9692030	1.0054278	1.0046152
13	158 50 17.3	2 6.11	1 37.6	1 47 45.8	3.80	0.9692549	1.0037653	1.0028785
17	158 58 41.7	2 6.08	1 37.6	1 48 1.0	3.79	0.9693070	1.0019554	1.0009968
21	159 7 6.1	2 6.05	1 37.6	1 48 16.1	3.78	0.9693592	1.0000031	0.9989753
25	159 15 30.2	2 6.02	1 37.5	1 48 31.2	3.77	0.9694114	0.9079141	0.9968201
29	159 23 54.2	2 5.99	+1 37.5	+1 48 46.3	+3.76	0.9694637	0.9956940	0.9945365
Nov. 2	159 32 18.1	2 5.96	1 37.5	1 49 1.3	3.75	0.9695160	0.9933484	0.9921304
6	159 40 41.9	2 5.93	1 37.5	1 49 16.3	3.74	0.9695684	0.9908832	0.9896076
10	159 49 5.5	2 5.90	1 37.4	1 49 31.2	3.72	0.9696208	0.9883050	0.9869761
14	159 57 29.0	2 5.87	1 37.4	1 49 46.0	3.71	0.9696732	0.9856224	0.9842450
18	160 5 52.5	2 5.84	+1 37.3	+1 50 0.9	+3.70	0.9697256	0.9828454	0.9814247
22	160 14 15.7	2 5.81	1 37.3	1 50 15.7	3.69	0.9697782	0.9799845	0.9785259
26	160 22 39.0	2 5.78	1 37.2	1 50 30.4	3.68	0.9698308	0.9770504	0.9755592
30	160 31 2.1	2 5.75	1 37.2	1 50 45.1	3 67	0.9698834	0.9740537	0.9725353
Dec. 4	160 39 25.0	2 5.72	1 37.1	1 50 59.8	3.66	0.9699361	0.9710056	0.9694663
8	160 47 47.8	2 5.69	+1 37.1	+1 51 14.4	+3.65	0.9699888	0.9679190	0.9663655
12	160 56 10.5	2 5.66	1 37.0	1 51 29.0	3.64	0.9700415	0.9648078	0.9632479
16	161 4 33.0	2 5.63	1 37.0	1 51 43.5	3.63	0.9700943	0.9616877	0.9601292
20	161 12 55.6	2 5.59	1 36.9	1 51 58.0	3.62	0.9701471	0.9585745	0.9570258
24	161 21 17.9	2 5.56	1 36.9	1 52 12.5	3.61	0.9702001	0.9554849	0.9539537
28	161 29 40.1	2 5.53	+1 36.8	+1 52 26.9	+3.60	0.9702531	0.9524343	0.9509286
32	161 38 2.2	2 5.50	+1 36.7	+1 52 41.2	+3.58	0.9703061	0.9494387	

URANUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	″	″	° ′ ″	″			
Jan. –2	203 19 56.7	45.90	–9.2	+0 35 37.0	–0.40	1.2655196	1.2721446	1.2706116
+6	203 26 3.9	45.90	9.2	0 35 33.8	0.40	1.2655384	1.2690467	1.2674563
14	203 32 11.1	45.89	9.2	0 35 30.6	0.40	1.2655573	1.2658478	1.2642279
22	203 38 18.2	45.89	9.2	0 35 27.4	0.40	1.2655763	1.2626055	1.2609888
30	203 44 25.3	45.88	9.2	0 35 24.2	0.40	1.2655953	1.2593865	1.2578061
Feb. 7	203 50 32.3	45.88	–9.2	+0 35 21.0	–0.40	1.2656144	1.2562561	1.2547438
15	203 56 39.3	45.87	9.2	0 35 17.8	0.40	1.2656335	1.2532773	1.2518651
23	204 2 46.3	45.87	9.2	0 35 14.6	0.40	1.2656526	1.2505156	1.2492364
Mar. 3	204 8 53.2	45.86	9.2	0 35 11.4	0.40	1.2656718	1.2480347	1.2469167
11	204 15 0.0	45.86	9.2	0 35 8.2	0.40	1.2656911	1.2458885	1.2449560
19	204 21 6.9	45.85	–9.2	+0 35 4.9	–0.40	1.2657104	1.2441253	1.2434008
27	204 27 13.7	45.85	9.2	0 35 1.7	0.41	1.2657298	1.2427875	1.2422888
Apr. 4	204 33 20.4	45.84	9.3	0 34 58.5	0.41	1.2657492	1.2419064	1.2416421
12	204 39 27.1	45.84	9.3	0 34 55.2	0.41	1.2657687	1.2414973	1.2414730
20	204 45 33.8	45.83	9.3	0 34 51.9	0.41	1.2657882	1.2415693	1.2417860
28	204 51 40.4	45.83	–9.3	+0 34 48.7	–0.41	1.2658077	1.2421208	1.2425705
May 6	204 57 47.0	45.82	9.3	0 34 45.4	0.41	1.2658273	1.2431319	1.2438017
14	205 3 53.6	45.82	9.3	0 34 42.1	0.41	1.2658470	1.2445759	1.2454504
22	205 10 0.1	45.81	9.3	0 34 38.8	0.41	1.2658667	1.2464197	1.2474780
30	205 16 6.6	45.81	9.3	0 34 35.6	0.41	1.2658865	1.2486185	1.2498343
June 7	205 22 13.0	45.80	–9.3	+0 34 32.3	–0.41	1.2659063	1.2511193	1.2524671
15	205 28 19.4	45.80	9.3	0 34 28.9	0.41	1.2659262	1.2538707	1.2553233
23	205 34 25.7	45.79	9.3	0 34 25.6	0.41	1.2659461	1.2568160	1.2583422
July 1	205 40 32.0	45.79	9.3	0 34 22.3	0.41	1.2659661	1.2598938	1.2614637
9	205 46 38.3	45.78	9.3	0 34 19.0	0.42	1.2659861	1.2630456	1.2646323
17	205 52 44.5	45.78	–9.3	+0 34 15.6	–0.42	1.2660062	1.2662169	1.2677919
25	205 58 50.7	45.77	9.3	0 34 12.3	0.42	1.2660263	1.2693501	1.2708852
Aug. 2	206 4 56.9	45.77	9.3	0 34 9.0	0.42	1.2660465	1.2723911	1.2738625
10	206 11 3.0	45.76	9.3	0 34 5.6	0.42	1.2660667	1.2752935	1.2766786
18	206 17 9.0	45.76	9.3	0 34 2.3	0.42	1.2660870	1.2780119	1.2792881
26	206 23 15.1	45.75	–9.3	+0 33 58.9	–0.42	1.2661073	1.2805021	1.2816502
Sept. 3	206 29 21.1	45.75	9.3	0 33 55.6	0.42	1.2661277	1.2827284	1.2837330
11	206 35 27.0	45.74	9.3	0 33 52.2	0.42	1.2661481	1.2846601	1.2855056
19	206 41 32.9	45.73	9.3	0 33 48.8	0.42	1.2661686	1.2862665	1.2869397
27	206 47 38.8	45.73	9.4	0 33 45.4	0.42	1.2661892	1.2875232	1.2880154
Oct. 5	206 53 44.6	45.72	–9.4	+0 33 42.1	–0.42	1.2662098	1.2884141	1.2887177
13	206 59 50.3	45.72	9.4	0 33 38.7	0.42	1.2662305	1.2889245	1.2890328
21	207 5 56.1	45.71	9.4	0 33 35.3	0.43	1.2662512	1.2890428	1.2889537
29	207 12 1.8	45.71	9.4	0 33 31.8	0.43	1.2662719	1.2587666	1.2884816
Nov. 6	207 18 7.4	45.70	9.4	0 33 28.4	0.43	1.2662927	1.2880992	1.2876199
14	207 24 13.6	45.70	–9.4	+0 33 25.0	–0.43	1.2663136	1.2870448	1.2863758
22	207 30 18.6	45.69	9.4	0 33 21.6	0.43	1.2663345	1.2856162	1.2847681
30	207 36 24.1	45.69	9.4	0 33 18.1	0.43	1.2663555	1.2838349	1.2828189
Dec. 8	207 42 29.6	45.68	9.4	0 33 14.7	0.43	1.2663766	1.2817239	1.2805537
16	207 48 35.0	45.68	9.4	0 33 11.3	0.43	1.2663976	1.2793130	1.2780071
24	207 54 40.4	45.67	–9.4	+0 33 7.8	–0.43	1.2664188	1.2766418	1.2752224
32	208 0 45.7	45.67	–9.4	+0 33 4.4	–0.43	1.2664400	1.2737543	

NEPTUNE.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	″	″	° ′ ″	″			
Jan.—2	63 21 52.3	22.00	−35.5	−1 38 28.6	+0.26	1.4745950	1.4627448	1.4633842
+6	63 24 48.2	22.00	35.6	1 38 26.5	0.27	1.4745965	1.4640785	1.4648248
14	63 27 44.2	22.00	35.7	1 38 24.4	0.27	1.4745980	1.4656187	1.4664562
22	63 30 40.2	22.00	35.7	1 38 22.3	0.27	1.4745995	1.4673326	1.4682428
30	63 33 36.2	22.00	35.8	1 38 20.1	0.27	1.4746010	1.4691817	1.4701440
Feb. 7	63 36 32.2	22.00	−35.8	−1 38 18.0	+0.27	1.4746025	1.4711250	1.4721200
15	63 39 28.2	22.00	35.9	1 38 15.9	0.27	1.4746041	1.4731240	1.4741320
23	63 42 24.1	22.00	36.0	1 38 13.7	0.27	1.4746056	1.4751389	1.4761391
Mar. 3	63 45 20.1	22.00	36.0	1 38 11.6	0.27	1.4746072	1.4771286	1.4781025
11	63 48 16.1	22.00	36.1	1 38 9.4	0.27	1.4746087	1.4790570	1.4799880
19	63 51 12.1	22.00	−36.1	−1 38 7.2	+0.27	1.4746103	1.4808913	1.4817625
27	63 54 8.1	22.00	36.2	1 38 5.1	0.27	1.4746118	1.4825983	1.4833948
Apr. 4	63 57 4.1	22.00	36.3	1 38 2.9	0.27	1.4746134	1.4841494	1.4848592
12	64 0 0.1	22.00	36.3	1 38 0.7	0.27	1.4746150	1.4855217	1.4861343
20	64 2 56.1	22.00	36.4	1 37 58.6	0.27	1.4746166	1.4866948	1.4872004
28	64 5 52.1	22.00	−36.4	−1 37 56.4	+0.27	1.4746182	1.4876500	1.4880417
May 6	64 8 48.1	22.00	36.5	1 37 54.2	0.27	1.4746198	1.4883748	1.4886481
14	64 11 44.1	22.00	36.6	1 37 52.0	0.27	1.4746214	1.4888608	1.4890119
22	64 14 40.1	22.00	36.6	1 37 49.8	0.27	1.4746230	1.4891011	1.4891277
30	64 17 36.1	22.00	36.7	1 37 47.6	0.27	1.4746246	1.4890925	1.4889960
June 7	64 20 32.1	22.00	−36.7	−1 37 45.4	+0.28	1.4746262	1.4888384	1.4886202
15	64 23 28.1	22.00	36.8	1 37 43.2	0.28	1.4746279	1.4883424	1.4880058
23	64 26 24.1	22.00	36.9	1 37 41.0	0.28	1.4746295	1.4876117	1.4871611
July 1	64 29 20.2	22.00	36.9	1 37 38.8	0.28	1.4746311	1.4866565	1.4861002
9	64 32 16.2	22.00	37.0	1 37 36.6	0.28	1.4746328	1.4854940	1.4848394
17	64 35 12.2	22.00	−37.0	−1 37 34.4	+0.28	1.4746344	1.4841393	1.4833961
25	64 38 8.2	22.00	37.1	1 37 32.1	0.28	1.4746361	1.4826131	1.4817935
Aug. 2	64 41 4.2	22.00	37.1	1 37 29.9	0.28	1.4746378	1.4809405	1.4800573
10	64 44 0.3	22.00	37.2	1 37 27.7	0.28	1.4746394	1.4791474	1.4782141
18	64 46 56.3	22.00	37.2	1 37 25.4	0.28	1.4746411	1.4772619	1.4762948
26	64 49 52.3	22.00	−37.3	−1 37 23.2	+0.28	1.4746428	1.4753172	1.4743335
Sept. 3	64 52 48.4	22.00	37.3	1 37 20.9	0.28	1.4746445	1.4733480	1.4723646
11	64 55 44.4	22.01	37.4	1 37 18.7	0.28	1.4746462	1.4713882	1.4704235
19	64 58 40.4	22.01	37.4	1 37 16.4	0.28	1.4746479	1.4694755	1.4685492
27	65 1 36.5	22.01	37.5	1 37 14.2	0.98	1.4746496	1.4676490	1.4667794
Oct. 5	65 4 32.6	22.01	−37.5	−1 37 11.9	+0.28	1.4746513	1.4659447	1.4651495
13	65 7 28.6	22.01	37.6	1 37 9.6	0.28	1.4746530	1.4643982	1.4636956
21	65 10 24.7	22.01	37.7	1 37 7.3	0.28	1.4746547	1.4630453	1.4624515
29	65 13 20.7	22.01	37.7	1 37 5.1	0.28	1.4746564	1.4619170	1.4614450
Nov. 6	65 16 16.8	22.01	37.8	1 37 2.8	0.29	1.4746581	1.4610383	1.4607001
14	65 19 12.8	22.01	−37.8	−1 37 0.5	+0.29	1.4746599	1.4604321	1.4602369
22	65 22 8.9	22.01	37.9	1 36 58.2	0.29	1.4746616	1.4601149	1.4600673
30	65 25 5.0	22.01	37.9	1 36 55.9	0.29	1.4746633	1.4600940	1.4601955
Dec. 8	65 28 1.0	22.01	38.0	1 36 53.6	0.29	1.4746650	1.4603710	1.4606206
16	65 30 57.1	22.01	38.0	1 36 51.3	0.29	1.4746668	1.4609420	1.4613342
24	65 33 53.2	22.01	−38.1	−1 36 49.0	+0.29	1.4746685	1.4617939	1.4623185
32	65 36 49.3	22.01	−38.1	−1 36 46.7	+0.29	1.4746703	1.4629056	

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Jan. 0	+0.1720565	+0.1806594	+792	−0.8880693	−0.8866261	+144	−0.3852855	−0.3846593	+ 21
1	0.1892477	0.1978212	781	0.8851142	0.8835337	155	0.3840031	0.3833172	27
2	0.2063791	0.2149206	769	0.8818847	0.8801674	166	0.3826014	0.3818562	32
3	0.2234452	0.2319523	758	0.8783819	0.8765284	177	0.3810811	0.3802768	38
4	0.2404411	0.2489113	746	0.8746069	0.8726178	187	0.3794428	0.3785796	43
5	+0.2573619	+0.2657927	+735	−0.8705610	−0.8684369	+197	−0.3776869	−0.3767651	+ 48
6	0.2742028	0.2825918	723	0.8662455	0.8639871	206	0.3758140	0.3748339	53
7	0.2909590	0.2993036	712	0.8616618	0.8592698	215	0.3738248	0.3727868	58
8	0.3076253	0.3159231	700	0.8568112	0.8542861	224	0.3717199	0.3706243	63
9	0.3241968	0.3324455	688	0.8516948	0.8490373	233	0.3694999	0.3683469	68
10	+0.3406690	+0.3488662	+676	−0.8463140	−0.8435249	+241	−0.3671653	−0.3659553	+ 72
11	0.3570369	0.3651801	664	0.8406703	0.8377504	249	0.3647167	0.3634500	77
12	0.3732953	0.3813819	652	0.8347653	0.8317153	256	0.3621548	0.3608317	81
13	0.3894392	0.3974666	640	0.8286004	0.8254211	263	0.3594803	0.3581012	86
14	0.4054636	0.4134293	628	0.8221772	0.8188694	270	0.3566940	0.3552592	90
15	+0.4213633	+0.4292647	+616	−0.8154974	−0.8120619	+277	−0.3537966	−0.3523064	+ 94
16	0.4371331	0.4449677	603	0.8085628	0.8050007	283	0.3507888	0.3492437	98
17	0.4527679	0.4605330	591	0.8013756	0.7976881	289	0.3476714	0.3460719	102
18	0.4682624	0.4759553	578	0.7939382	0.7901264	295	0.3444454	0.3427920	106
19	0.4836113	0.4912295	566	0.7862528	0.7823178	301	0.3411119	0.3394051	110
20	+0.4988095	+0.5063506	+554	−0.7783217	−0.7742648	+306	−0.3376719	−0.3359122	+113
21	0.5138523	0.5213140	542	0.7701475	0.7659701	311	0.3341263	0.3323143	117
22	0.5287350	0.5361148	530	0.7617331	0.7574368	316	0.3304762	0.3286126	120
23	0.5434527	0.5507481	518	0.7530815	0.7486678	321	0.3267231	0.3248085	123
24	0.5580004	0.5652089	506	0.7441957	0.7396661	325	0.3228685	0.3209035	126
25	+0.5723731	+0.5794926	+494	−0.7350790	−0.7304351	+329	−0.3189136	−0.3168989	+129
26	0.5865665	0.5935949	482	0.7257346	0.7209781	332	0.3148596	0.3127960	132
27	0.6005766	0.6075118	470	0.7161658	0.7112983	336	0.3107080	0.3085961	135
28	0.6143994	0.6212393	458	0.7063758	0.7013990	339	0.3064603	0.3043009	137
29	0.6280308	0.6347734	446	0.6963681	0.6912838	342	0.3021181	0.2999120	140
30	+0.6414667	+0.6481101	+434	−0.6861463	−0.6809562	+344	−0.2976829	−0.2954308	+142
31	0.6547033	0.6612459	422	0.6757136	0.6704194	347	0.2931561	0.2908589	144
Feb. 1	0.6677374	0.6741773	411	0.6650735	0.6596769	349	0.2885393	0.2861977	146
2	0.6805653	0.6869007	399	0.6542296	0.6487322	351	0.2838341	0.2814488	148
3	0.6931833	0.6994125	388	0.6431849	0.6375883	352	0.2790419	0.2766136	150
4	+0.7055879	+0.7117092	+376	−0.6319426	−0.6262486	+354	−0.2741641	−0.2716935	+152
5	0.7177758	0.7237875	365	0.6205063	0.6147166	355	0.2692021	0.2666900	154
6	0.7297438	0.7356442	354	0.6088796	0.6029959	356	0.2641575	0.2616046	156
7	0.7414884	0.7472759	343	0.5970657	0.5910897	357	0.2590318	0.2564390	157
8	0.7530061	0.7586789	332	0.5850680	0.5790014	358	0.2538266	0.2511947	158
9	+0.7642936	+0.7698499	+321	−0.5728899	−0.5667344	+359	−0.2485435	−0.2458732	+159
10	0.7753473	0.7807854	310	0.5605350	0.5542925	360	0.2431838	0.2404757	160
11	0.7861639	0.7914823	300	0.5480069	0.5416791	360	0.2377489	0.2350038	161
12	0.7967402	0.8019372	289	0.5353092	0.5288979	360	0.2322405	0.2294593	162
13	0.8070728	0.8121466	279	0.5224456	0.5159528	360	0.2266603	0.2238439	162
14	+0.8171580	+0.8221068	+268	−0.5094202	−0.5028480	+360	−0.2210100	−0.2181591	+163
15	+0.8269923	+0.8318145	+258	−0.4962370	−0.4895875	+359	−0.2152912	−0.2124067	+163

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Feb. 15	+0.8269923	+0.8318145	+258	−0.4962370	−0.4895875	+359	−0.2152912	−0.2124067	+163
16	0.8365727	0.8412668	248	0.4829001	0.4761754	358	0.2095058	0.2065887	164
17	0.8458962	0.8504608	238	0.4694139	0.4626161	358	0.2036555	0.2007067	164
18	0.8549599	0.8593934	228	0.4557827	0.4489142	358	0.1977422	0.1947626	164
19	0.8637606	0.8680616	219	0.4420112	0.4350742	357	0.1917679	0.1887585	164
20	+0.8722958	+0.8764630	+209	−0.4281039	−0.4211007	+356	−0.1857346	−0.1826964	+164
21	0.8805629	0.8845950	200	0.4140652	0.4069981	355	0.1796442	0.1765781	164
22	0.8885593	0.8924552	191	0.3998997	0.3927712	354	0.1734985	0.1704057	164
23	0.8962827	0.9000414	182	0.3856127	0.3784251	353	0.1672998	0.1641814	163
24	0.9037311	0.9073517	173	0.3712089	0.3639646	352	0.1610504	0.1579073	163
25	+0.9109029	+0.9143845	+164	−0.3566929	−0.3493943	+350	−0.1547523	−0.1515855	+162
26	0.9177963	0.9211380	155	0.3420693	0.3347187	348	0.1484073	0.1452180	162
27	0.9244095	0.9276105	147	0.3273429	0.3199426	346	0.1420176	0.1388068	161
28	0.9307409	0.9338006	138	0.3125184	0.3050709	344	0.1355854	0.1323540	160
Mar. 1	0.9367893	0.9397071	130	0.2976006	0.2901081	342	0.1291126	0.1258617	159
2	+0.9425537	+0.9453290	+122	−0.2825939	−0.2750586	+340	−0.1226012	−0.1193318	+158
3	0.9480329	0.9506652	114	0.2675026	0.2599267	337	0.1160533	0.1127663	156
4	0.9532256	0.9557142	106	0.2523313	0.2447170	335	0.1094708	0.1061672	155
5	0.9581306	0.9604750	99	0.2370844	0.2294339	332	0.1028556	0.0995363	153
6	0.9627469	0.9649466	91	0.2217662	0.2140818	330	0.0962095	0.0928756	152
7	+0.9670736	+0.9691280	+ 84	−0.2063812	−0.1986650	+327	−0.0895346	−0.0861870	+150
8	0.9711095	0.9730182	76	0.1909337	0.1831879	324	0.0828328	0.0794725	149
9	0.9748536	0.9766161	69	0.1754281	0.1676550	321	0.0761060	0.0727339	147
10	0.9783051	0.9799208	62	0.1598690	0.1520708	318	0.0693561	0.0659732	145
11	0.9814629	0.9829313	55	0.1442609	0.1364399	315	0.0625850	0.0591922	143
12	+0.9843259	+0.9856466	+ 48	−0.1286082	−0.1207665	+312	−0.0557946	−0.0523928	+141
13	0.9868931	0.9880656	42	0.1129151	0.1050549	308	0.0489868	0.0455770	139
14	0.9891637	0.9901876	35	0.0971862	0.0893100	305	0.0421635	0.0387468	137
15	0.9911370	0.9920119	29	0.0814267	0.0735370	302	0.0353269	0.0319044	135
16	0.9928122	0.9935378	23	0.0656415	0.0577407	299	0.0284791	0.0250518	133
17	+0.9941887	+0.9947648	+ 17	−0.0498353	−0.0419259	+295	−0.0216222	−0.0181910	+130
18	0.9952661	0.9956925	11	0.0340131	0.0260976	292	0.0147581	0.0113240	128
19	0.9960440	0.9963206	+ 6	0.0181799	−0.0102608	288	0.0078889	−0.0044531	125
20	0.9965222	0.9966459	0	−0.0023407	+0.0055795	284	−0.0010169	+0.0024193	123
21	0.9967007	0.9966776	− 5	+0.0134995	0.0214182	280	+0.0058554	0.0092909	120
22	+0.9965797	+0.9964070	− 10	+0.0293353	+0.0372500	+276	+0.0127257	+0.0161595	+118
23	0.9961596	0.9958376	15	0.0451616	0.0530697	272	0.0195920	0.0230230	115
24	0.9954410	0.9949701	20	0.0609734	0.0688724	268	0.0264524	0.0298796	113
25	0.9944247	0.9938051	24	0.0767660	0.0846536	263	0.0333047	0.0367271	110
26	0.9931114	0.9923436	29	0.0925346	0.1004084	259	0.0401467	0.0435632	108
27	+0.9915020	+0.9905866	− 33	+0.1082743	+0.1161318	+255	+0.0469762	+0.0503856	+105
28	0.9895977	0.9885354	37	0.1239802	0.1318190	251	0.0537909	0.0571922	102
29	0.9873999	0.9861912	41	0.1396475	0.1474654	246	0.0605889	0.0639811	99
30	0.9849098	0.9835553	45	0.1552719	0.1630668	241	0.0673683	0.0707504	97
31	0.9821285	0.9806290	48	0.1708494	0.1786192	237	0.0741271	0.0774982	94
32	+0.9790573	+0.9774135	− 52	+0.1863756	+0.1941181	+233	+0.0808634	+0.0842226	+ 91
33	+0.9756977	+0.9739102	− 55	+0.2018459	+0.2095589	+228	+0.0875755	+0.0909219	+ 88

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Apr. 1	+0.9790573	+0.9774135	−52	+0.1863756	+0.1941181	+233	+0.0808634	+0.0842226	+91
2	0.9756977	0.9739102	55	0.2018459	0.2095589	228	0.0875755	0.0909219	88
3	0.9720511	0.9701206	58	0.2172561	0.2249375	223	0.0942614	0.0975940	84
4	0.9681189	0.9660461	61	0.2326022	0.2402499	218	0.1009193	0.1042371	81
5	0.9639025	0.9616882	64	0.2478799	0.2554918	213	0.1075473	0.1108495	78
6	+0.9594033	+0.9570482	−66	+0.2630850	+0.2706592	+209	+0.1141437	+0.1174295	+75
7	0.9546228	0.9521275	68	0.2782136	0.2857479	204	0.1207068	0.1239753	72
8	0.9495624	0.9469276	70	0.2932614	0.3007538	198	0.1272348	0.1304851	69
9	0.9442233	0.9414497	72	0.3082244	0.3156728	192	0.1337259	0.1369570	66
10	0.9386069	0.9356953	74	0.3230983	0.3305005	187	0.1401782	0.1433893	63
11	+0.9327148	+0.9296659	−76	+0.3378788	+0.3452327	+181	+0.1465900	+0.1497802	+60
12	0.9265486	0.9233633	77	0.3525615	0.3598649	176	0.1529595	0.1561278	57
13	0.9201101	0.9167893	78	0.3671422	0.3743929	170	0.1592849	0.1624303	54
14	0.9134011	0.9099458	79	0.3816163	0.3888121	165	0.1655641	0.1686858	51
15	0.9064236	0.9028348	80	0.3959794	0.4031181	159	0.1717952	0.1748923	48
16	+0.8991796	+0.8954584	−80	+0.4102273	+0.4173068	+154	+0.1779764	+0.1810479	+45
17	0.8916713	0.8878187	80	0.4243558	0.4313739	148	0.1841060	0.1871508	42
18	0.8839009	0.8799182	80	0.4383605	0.4453150	143	0.1901821	0.1931994	40
19	0.8758709	0.8717594	80	0.4522368	0.4591256	137	0.1962026	0.1991915	37
20	0.8675841	0.8633453	79	0.4659804	0.4728013	132	0.2021657	0.2051252	34
21	+0.8590434	+0.8546788	−78	+0.4795873	+0.4863382	+127	+0.2080696	+0.2109988	+31
22	0.8502519	0.8457630	77	0.4930535	0.4997325	122	0.2139125	0.2168105	28
23	0.8412125	0.8366008	76	0.5063749	0.5129801	116	0.2196927	0.2225590	25
24	0.8319283	0.8271955	74	0.5195477	0.5260772	111	0.2254089	0.2282419	22
25	0.8224027	0.8175505	73	0.5325680	0.5390199	105	0.2310580	0.2338573	19
26	+0.8126390	+0.8076690	−71	+0.5454322	+0.5518048	+100	+0.2366398	+0.2394050	+17
27	0.8026405	0.7975543	69	0.5581372	0.5644290	94	0.2421524	0.2448822	14
28	0.7924105	0.7872098	67	0.5706798	0.5768891	89	0.2475943	0.2502886	11
29	0.7819525	0.7766391	65	0.5830565	0.5891816	83	0.2529646	0.2556219	8
30	0.7712699	0.7658454	62	0.5952641	0.6013035	77	0.2582606	0.2608807	5
May 1	+0.7603659	+0.7548320	−59	+0.6072995	+0.6132517	+ 71	+0.2634821	+0.2660645	+ 3
2	0.7492439	0.7436022	56	0.6191596	0.6250231	66	0.2686274	0.2711712	0
3	0.7379072	0.7321594	53	0.6308415	0.6366148	61	0.2736952	0.2761996	− 2
4	0.7263591	0.7205068	49	0.6423423	0.6480240	56	0.2786844	0.2811493	5
5	0.7146029	0.7086478	45	0.6536593	0.6592479	51	0.2835940	0.2860182	7
6	+0.7026418	+0.6965855	−41	+0.6647895	+0.6702836	+ 46	+0.2884219	+0.2908053	− 9
7	0.6904792	0.6843233	37	0.6757299	0.6811280	41	0.2931677	0.2955094	11
8	0.6781182	0.6718643	32	0.6864774	0.6917779	37	0.2978297	0.3001291	14
9	0.6655620	0.6592118	27	0.6970290	0.7022305	32	0.3024067	0.3046629	16
10	0.6528139	0.6463692	22	0.7073819	0.7124829	28	0.3068976	0.3091106	18
11	+0.6398777	+0.6333403	−17	+0.7175331	+0.7225321	+ 23	+0.3113015	+0.3134700	−20
12	0.6267570	0.6201287	12	0.7274796	0.7323751	19	0.3156161	0.3177398	22
13	0.6134556	0.6067380	7	0.7372182	0.7420086	15	0.3198410	0.3219195	24
14	0.5999764	0.5931719	− 1	0.7467460	0.7514299	11	0.3239748	0.3260069	26
15	0.5863241	0.5794340	+ 6	0.7560600	0.7606360	7	0.3280154	0.3300006	28
16	+0.5725022	+0.5655292	+12	+0.7651574	+0.7696241	+ 3	+0.3319625	+0.3339007	−29
17	+0.5585151	+0.5514610	+19	+0.7740355	+0.7783915	0	+0.3358149	+0.3377049	−31

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.
May 17	+0.5585151	+0.5514610	+ 19	+0.7740355	+0.7783915	0	+0.3358146	+0.3377049	−31
18	0.5443672	0.5372343	26	0.7826917	0.7869357	− 4	0.3395706	0.3414123	32
19	0.5300630	0.5228536	33	0.7911231	0.7952537	7	0.3432292	0.3450217	34
20	0.5156070	0.5083234	40	0.7993273	0.8033434	11	0.3467893	0.3485321	35
21	0.5010036	0.4936480	47	0.8073020	0.8112026	15	0.3502498	0.3519424	36
22	+0.4862573	+0.4788320	+ 55	+0.8150451	+0.818 293	−18	+0.3536097	+0.3552517	−37
23	0.4713727	0.4638801	62	0.8225548	0.8262215	21	0.3568683	0.3584593	38
24	0.4563547	0.4487971	70	0.8298291	0.8333774	23	0.3600247	0.3615643	38
25	0.4412080	0.4335876	78	0.8368660	0.8402950	25	0.3630781	0.3645659	39
26	0.4259368	0.4182559	86	0.8436639	0.8469728	26	0.3660277	0.3674633	40
27	+0.4105456	+0.4028065	+ 94	+0.8502214	+0.8534095	−28	+0.3688728	+0.3702560	−41
28	0.3950393	0.3872444	103	0.8565370	0.8596037	29	0.3716129	0.3729433	41
29	0.3794226	0.3715742	111	0.8626095	0.8655542	30	0.3742472	0.3755246	42
30	0.3637000	0.3558002	120	0.8684376	0.8712597	31	0.3767753	0.3779994	42
31	0.3478755	0.3399263	128	0.8740201	0.8767189	32	0.3791968	0.3803674	43
June 1	+0.3319532	+0.3239569	+137	+0.8793558	+0.8819307	−33	+0.3815112	+0.3826280	−43
2	0.3159379	0.3078968	146	0.8844434	0.8868939	33	0.3837179	0.3847806	44
3	0.2998341	0.2917502	155	0.8892818	0.8916072	33	0.3858163	0.3868248	44
4	0.2836457	0.2755210	164	0.8938698	0.8960695	33	0.3878061	0.3887601	44
5	0.2673767	0.2592133	173	0.8982062	0.9002797	32	0.3896868	0.3905861	44
6	+0.2510314	+0.2428316	+182	+0.9022898	+0.9042365	−32	+0.3914579	+0.3923022	−44
7	0.2346144	0.2263803	191	0.9061195	0.9079388	31	0.3931188	0.3939078	44
8	0.2181300	0.2098638	200	0.9096940	0.9113852	30	0.3946691	0.3954026	44
9	0.2015826	0.1932866	210	0.9130120	0.9145745	28	0.3961083	0.3967861	43
10	0.1849766	0.1766531	219	0.9160724	0.9175057	27	0.3974360	0.3980579	42
11	+0.1683166	+0.1599679	+229	+0.9188742	+0.9201778	−25	+0.3986517	+0.3992174	−41
12	0.1516075	0.1432361	238	0.9214163	0.9225897	23	0.3997548	0.4002640	40
13	0.1348542	0.1264625	248	0.9236977	0.9247403	20	0.4007449	0.4011974	39
14	0.1180616	0.1096521	257	0.9257174	0.9266289	17	0.4016216	0.4020173	38
15	0.1012345	0.0928096	267	0.9274747	0.9282548	14	0.4023846	0.4027233	37
16	+0.0843779	+0.0759402	+276	+0.9289690	+0.9296174	−11	+0.4030336	+0.4033152	−36
17	0.0674968	0.0590488	285	0.9301998	0.9307163	7	0.4035683	0.4037927	34
18	0.0505964	0.0421407	294	0.9311669	0.9315514	− 3	0.4039885	0.4041556	33
19	0.0336820	0.0252212	304	0.9318699	0.9321224	+ 2	0.4042941	0.4044039	31
20	+0.0167588	+0.0082955	313	0.9323088	0.9324293	8	0.4044851	0.4045376	30
21	−0.0001682	−0.0086315	+322	+0.9324837	+0.9324722	+12	+0.4045615	+0.4045568	−28
22	0.0170941	0.0255550	331	0.9323948	0.9322516	18	0.4045234	0.4044615	27
23	0.0340139	0.0424699	340	0.9320425	0.9317678	23	0.4043709	0.4042518	25
24	0.0509226	0.0593712	349	0.9314273	0.9310214	29	0.4041041	0.4039280	23
25	0.0678153	0.0762541	357	0.9305498	0.9300129	35	0.4037233	0.4034903	21
26	−0.0846872	−0.0931139	+365	+0.9294105	+0.9287429	+41	+0.4032287	+0.4029389	−19
27	0.1015339	0.1099463	373	0.9280099	0.9272119	48	0.4026206	0.4022742	16
28	0.1183508	0.1267466	381	0.9263487	0.9254208	55	0.4018994	0.4014966	13
29	0.1351332	0.1435101	389	0.9244278	0.9233704	62	0.4010655	0.4006065	10
30	0.1518766	0.1602324	397	0.9222481	0.9210616	70	0.4001193	0.3996043	8
31	−0.1685768	−0.1769095	+404	+0.9198105	+0.9184952	+77	+0.3990612	+0.3984903	− 5
32	−0.1852298	−0.1935371	+412	+0.9171155	+0.9156716	+85	+0.3978913	+0.3972646	− 2

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
July 1	–0.1685768	–0.1769095	+404	+0.9198105	+0.9184952	+ 77	+0.3990612	+0.3984903	– 5
2	0.1852298	0.1935371	412	0.9171155	0.9156716	85	0.3978913	0.3972646	– 2
3	0.2018309	0.2101107	419	0.9141636	0.9125914	93	0.3966100	0.3959276	+ 1
4	0.2183758	0.2266259	426	0.9109554	0.9092555	101	0.3952176	0.3944799	4
5	0.2348602	0.2430784	433	0.9074919	0.9056648	110	0.3937146	0.3929218	7
6	–0.2512797	–0.2594638	+440	+0.9037741	+0.9018201	+119	+0.3921014	+0.3912536	+ 10
7	0.2676299	0.2757777	446	0.8998027	0.8977219	128	0.3903783	0.3894756	14
8	0.2839063	0.2920155	453	0.8955780	0.8933709	137	0.3885455	0.3875881	17
9	0.3001044	0.3081727	459	0.8911008	0.8887678	147	0.3866034	0.3855915	20
10	0.3162196	0.3242447	465	0.8863722	0.8839138	156	0.3845523	0.3834861	23
11	–0.3322473	–0.3402269	+470	+0.8813932	+0.8788101	+166	+0.3823927	+0.3812724	+ 27
12	0.3481827	0.3561143	475	0.8761650	0.8734578	176	0.3801250	0.3789509	30
13	0.3640208	0.3719019	480	0.8706887	0.8678580	186	0.3777498	0.3765221	34
14	0.3797568	0.3875850	485	0.8649656	0.8620120	196	0.3752676	0.3739867	38
15	0.3953860	0.4031590	489	0.8589972	0.8559216	207	0.3726791	0.3713452	42
16	–0.4109036	–0.4186191	+493	+0.8527853	+0.8495887	+218	+0.3699848	+0.3685982	+ 46
17	0.4263050	0.4339607	497	0.8463318	0.8430151	229	0.3671855	0.3657467	50
18	0.4415856	0.4491792	500	0.8396385	0.8362026	240	0.3642821	0.3627916	54
19	0.4567407	0.4642698	503	0.8327073	0.8291533	251	0.3612755	0.3597337	58
20	0.4717656	0.4792279	506	0.8255404	0.8218693	262	0.3581664	0.3565737	62
21	–0.4866557	–0.4940490	+508	+0.8181400	+0.8143529	+273	+0.3549558	+0.3533127	+ 67
22	0.5014068	0.5087291	510	0.8105084	0.8066067	284	0.3516448	0.3499519	71
23	0.5160151	0.5232643	512	0.8026481	0.7986330	296	0.3482345	0.3464924	76
24	0.5304763	0.5376503	514	0.7945617	0.7904345	308	0.3447259	0.3429351	80
25	0.5447861	0.5518831	515	0.7862518	0.7820137	320	0.3411202	0.3392813	85
26	–0.5589407	–0.5659587	+516	+0.7777208	+0.7733731	+332	+0.3374185	+0.3355320	+ 89
27	0.5729364	0.5798736	517	0.7689711	0.7645151	344	0.3336218	0.3316883	94
28	0.5867698	0.5936244	517	0.7600054	0.7554424	356	0.3297314	0.3277514	99
29	0.6004371	0.6072073	517	0.7508264	0.7461577	368	0.3257485	0.3237226	104
30	0.6139346	0.6206186	516	0.7414366	0.7366634	380	0.3216741	0.3196029	109
31	–0.6272588	–0.6338549	+515	+0.7318383	+0.7269617	+392	+0.3175093	+0.3153933	+114
Aug. 1	0.6404063	0.6469127	514	0.7220339	0.7170552	404	0.3132552	0.3110950	119
2	0.6533736	0.6597886	512	0.7120259	0.7069464	416	0.3089130	0.3067092	124
3	0.6661572	0.6724790	510	0.7018170	0.6966380	428	0.3044838	0.3022369	129
4	0.6787534	0.6849802	508	0.6914097	0.6861324	441	0.2999686	0.2976791	134
5	–0.6911587	–0.6972887	+506	+0.6808064	+0.6754320	+453	+0.2953685	+0.2930370	+139
6	0.7033696	0.7094010	503	0.6700095	0.6645393	465	0.2906846	0.2883116	144
7	0.7153824	0.7213133	500	0.6590217	0.6534571	477	0.2859181	0.2835042	149
8	0.7271933	0.7330219	496	0.6478459	0.6421884	489	0.2810701	0.2786159	154
9	0.7387987	0.7445231	492	0.6364851	0.6307362	501	0.2761419	0.2736480	159
10	–0.7501948	–0.7558131	+488	+0.6249422	+0.6191033	+513	+0.2711347	+0.2686018	+165
11	0.7613778	0.7668882	483	0.6132200	0.6072927	525	0.2660496	0.2634784	170
12	0.7723442	0.7777450	478	0.6013217	0.5953077	537	0.2608881	0.2582793	176
13	0.7830904	0.7883798	473	0.5892508	0.5831518	549	0.2556518	0.2530060	181
14	0.7936128	0.7987891	467	0.5770108	0.5708285	560	0.2503421	0.2476601	187
15	–0.8039081	–0.8089696	+461	+0.5646052	+0.5583414	+572	+0.2449603	+0.2422429	+192
16	–0.8139730	–0.8189180	+454	+0.5520375	+0.5456942	+583	+0.2395080	+0.2367560	+198

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Aug. 16	−0.8139730	−0.8189180	+454	+0.5520375	+0.5456942	+583	+0.2395080	+0.2367560	+198
17	0.8238042	0.8286312	447	0.5393116	0.5328907	595	0.2339869	0.2312012	204
18	0.8333985	0.8381060	440	0.5264315	0.5199350	606	0.2283988	0.2255802	209
19	0.8427530	0.8473396	433	0.5134013	0.5068312	618	0.2227453	0.2198947	214
20	0.8518651	0.8563294	425	0.5002249	0.4935831	629	0.2170283	0.2141465	219
21	−0.8607321	−0.8650729	+417	+0.4869061	+0.4801945	+640	+0.2112494	+0.2083373	+225
22	0.8693515	0.8735677	408	0.4734487	0.4666693	650	0.2054103	0.2024688	231
23	0.8777212	0.8818116	399	0.4598568	0.4530117	661	0.1995127	0.1965427	236
24	0.8858388	0.8898022	391	0.4461345	0.4392258	671	0.1935586	0.1905610	242
25	0.8937019	0.8975374	381	0.4322859	0.4253155	681	0.1875497	0.1845253	247
26	−0.9013084	−0.9050151	+371	+0.4183149	+0.4112847	+691	+0.1814876	+0.1784372	+253
27	0.9086566	0.9122334	361	0.4042252	0.3971370	701	0.1753740	0.1722985	258
28	0.9157446	0.9191905	351	0.3900204	0.3828761	710	0.1692107	0.1661109	263
29	0.9225705	0.9258846	340	0.3757044	0.3685060	719	0.1629994	0.1598762	269
30	0.9291324	0.9323137	329	0.3612812	0.3540306	728	0.1567416	0.1535959	274
31	−0.9354282	−0.9384757	+318	+0.3467546	+0.3394538	+737	+0.1504391	+0.1472717	+279
Sept. 1	0.9414560	0.9443688	306	0.3321285	0.3247793	746	0.1440936	0.1409052	284
2	0.9472140	0.9499911	294	0.3174065	0.3100108	755	0.1377066	0.1344981	290
3	0.9527002	0.9553407	282	0.3025924	0.2951520	763	0.1312797	0.1280519	295
4	0.9579126	0.9604156	270	0.2876900	0.2802069	771	0.1248147	0.1215685	300
5	−0.9628494	−0.9652139	+258	+0.2727033	+0.2651796	+779	+0.1183133	+0.1150495	+305
6	0.9675087	0.9697336	245	0.2576365	0.2500744	787	0.1117771	0.1084966	310
7	0.9718884	0.9739729	232	0.2424939	0.2348955	794	0.1052080	0.1019118	315
8	0.9759868	0.9779300	219	0.2272798	0.2196473	801	0.0986079	0.0952969	320
9	0.9798022	0.9816033	205	0.2119985	0.2043340	808	0.0919786	0.0886536	324
10	−0.9833329	−0.9849911	+191	+0.1966542	+0.1889598	+815	+0.0853219	+0.0819839	+329
11	0.9865773	0.9880917	177	0.1812514	0.1735295	821	0.0786397	0.0752897	333
12	0.9895338	0.9909037	163	0.1657948	0.1580479	827	0.0719340	0.0685731	338
13	0.9922010	0.9934258	149	0.1502894	0.1425199	833	0.0652070	0.0618362	342
14	0.9945778	0.9956571	134	0.1347399	0.1269501	839	0.0584607	0.0550810	347
15	−0.9966634	−0.9975968	+119	+0.1191510	+0.1113434	+844	+0.0516971	+0.0483096	+351
16	0.9984570	0.9992440	104	0.1035277	0.0957047	849	0.0449183	0.0415241	356
17	0.9999578	1.0005982	89	0.0878748	0.0800388	854	0.0381266	0.0347267	360
18	1.0011654	1.0016590	74	0.0721971	0.0643505	859	0.0313241	0.0279195	365
19	1.0020794	1.0024262	58	0.0564993	0.0486445	863	0.0245128	0.0211046	369
20	−1.0026996	−1.0028995	+ 42	+0.0407863	+0.0329257	+867	+0.0176949	+0.0142841	+373
21	1.0030259	1.0030788	26	0.0250630	0.0171989	871	0.0108724	0.0074602	377
22	1.0030582	1.0029641	+ 10	+0.0093339	+0.0014685	874	+0.0040475	+0.0006347	381
23	1.0027966	1.0025557	− 7	−0.0063966	−0.0142610	877	−0.0027779	−0.0061901	385
24	1.0022414	1.0018539	23	0.0221240	0.0299851	880	0.0096019	0.0130127	389
25	−1.0013929	−1.0008589	− 40	−0.0378437	−0.0456993	+883	−0.0164225	−0.0198309	+392
26	1.0002515	0.9995712	57	0.0535514	0.0613993	885	0.0232377	0.0266427	396
27	0.9988176	0.9979910	74	0.0692427	0.0770807	887	0.0300456	0.0334462	399
28	0.9970914	0.9961186	91	0.0849131	0.0927392	889	0.0368443	0.0402396	402
29	0.9950729	0.9939540	108	0.1005584	0.1083704	891	0.0436319	0.0470210	405
30	−0.9927622	−0.9914974	−125	−0.1161744	−0.1239701	+893	−0.0504066	−0.0537886	+408
31	−0.9901596	−0.9887491	−143	−0.1317567	−0.1395340	+894	−0.0571667	−0.0605407	+410

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Oct. 1	−0.9901596	−0.9887491	− 143	−0.1317567	−0.1395340	+894	−0.0571667	−0.0605407	+410
2	0.9872658	0.9857098	160	0.1473012	0.1550579	896	0.0639103	0.0672753	413
3	0.9840813	0.9823800	178	0.1628035	0.1705373	896	0.0706354	0.0739904	415
4	0.9806063	0.9787600	196	0.1782589	0.1859676	897	0.0773402	0.0806843	418
5	0.9768411	0.9748500	214	0.1936628	0.2013442	896	0.0840227	0.0873550	420
6	−0.9727862	−0.9706504	− 232	−0.2090109	−0.2166626	+896	−0.0906810	−0.0940005	+422
7	0.9684422	0.9661620	250	0.2242986	0.2319183	895	0.0973132	0.1006188	424
8	0.9638098	0.9613857	268	0.2395211	0.2471064	894	0.1039172	0.1072079	426
9	0.9588898	0.9563223	287	0.2546734	0.2622217	893	0.1104909	0.1137656	428
10	0.9536833	0.9509729	305	0.2697505	0.2772594	892	0.1170321	0.1202899	430
11	−0.9481913	−0.9453386	− 324	−0.2847477	−0.2922149	+891	−0.1235388	−0.1267786	+431
12	0.9424150	0.9394207	342	0.2996603	0.3070834	889	0.1300090	0.1332297	432
13	0.9363560	0.9332210	361	0.3144835	0.3218600	887	0.1364405	0.1396410	433
14	0.9300160	0.9267412	380	0.3292123	0.3365398	885	0.1428311	0.1460104	434
15	0.9233967	0.9199830	399	0.3438418	0.3511179	882	0.1491789	0.1523360	434
16	−0.9165001	−0.9129485	− 418	−0.3583674	−0.3655899	+879	−0.1554817	−0.1586156	+435
17	0.9093283	0.9056400	437	0.3727846	0.3799512	875	0.1617374	0.1648470	436
18	0.9018837	0.8980598	456	0.3870889	0.3941973	872	0.1679441	0.1710284	437
19	0.8941686	0.8902102	475	0.4012757	0.4083237	868	0.1740999	0.1771580	437
20	0.8861852	0.8820937	494	0.4153406	0.4223261	864	0.1802027	0.1832337	437
21	−0.8779361	−0.8737127	− 513	−0.4292795	−0.4362005	+859	−0.1862507	−0.1892537	+437
22	0.8694239	0.8650700	532	0.4430884	0.4499428	855	0.1922422	0.1952162	437
23	0.8606515	0.8561686	552	0.4567629	0.4535486	850	0.1981753	0.2011194	436
24	0.8516218	0.8470112	571	0.4702991	0.4770141	845	0.2040482	0.2069616	435
25	0.8423372	0.8376001	591	0.4836931	0.4903355	839	0.2098592	0.2127410	434
26	−0.8328001	−0.8279377	− 610	−0.4969411	−0.5035091	+834	−0.2156067	−0.2184561	+433
27	0.8230131	0.8180268	630	0.5100393	0.5165310	828	0.2212891	0.2241053	432
28	0.8129790	0.8078703	649	0.5229838	0.5293974	822	0.2269047	0.2296870	431
29	0.8027008	0.7974709	669	0.5357712	0.5421049	815	0.2324520	0.2351996	430
30	0.7921811	0.7868312	688	0.5483979	0.5546498	808	0.2379295	0.2406416	429
31	−0.7814220	−0.7759536	− 708	−0.5608601	−0.5670282	+801	−0.2433356	−0.2460114	+427
Nov. 1	0.7704263	0.7648408	727	0.5731538	0.5792362	793	0.2486687	0.2513073	425
2	0.7591970	0.7534959	747	0.5852751	0.5912698	785	0.2539270	0.2565276	423
3	0.7477372	0.7419219	766	0.5972201	0.6031253	777	0.2591088	0.2616706	421
4	0.7360499	0.7301218	786	0.6089851	0.6147989	769	0.2642126	0.2667348	418
5	−0.7241379	−0.7180986	− 805	−0.6205662	−0.6262866	+760	−0.2692369	−0.2717186	+415
6	0.7120042	0.7058554	825	0.6319595	0.6375845	751	0.2741798	0.2766203	412
7	0.6996521	0.6933955	844	0.6431611	0.6486887	742	0.2790396	0.2814380	409
8	0.6870852	0.6807226	864	0.6541671	0.6595954	732	0.2838147	0.2861700	405
9	0.6743074	0.6678408	883	0.6649735	0.6703007	722	0.2885033	0.2908148	402
10	−0.6613227	−0.6547539	− 902	−0.6755766	−0.6808009	+711	−0.2931039	−0.2953708	+398
11	0.6481347	0.6414656	921	0.6859729	0.6910924	701	0.2976150	0.2998365	395
12	0.6347472	0.6279800	941	0.6961589	0.7011719	689	0.3020349	0.3042102	391
13	0.6211645	0.6143014	960	0.7061310	0.7110358	677	0.3063620	0.3084903	387
14	0.6073912	0.6004345	979	0.7158857	0.7206806	665	0.3105947	0.3126753	383
15	−0.5934318	−0.5863837	− 998	−0.7254198	−0.7301032	+653	−0.3147317	−0.3167639	+379
16	−0.5792908	−0.5721536	−1017	−0.7347302	−0.7393007	+640	−0.3187716	−0.3207548	+374

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Nov. 16	−0.5792908	−0.5721536	−1017	−0.7347302	−0.7393007	+640	−0.3187716	−0.3207548	+374
17	0.5649728	0.5577487	1036	0.7438141	0.7482703	627	0.3227132	0.3246467	369
18	0.5504822	0.5431736	1054	0.7526687	0.7570092	613	0.3265552	0.3284385	363
19	0.5358236	0.5284328	1073	0.7612912	0.7655147	599	0.3302964	0.3321289	358
20	0.5210017	0.5135312	1091	0.7696791	0.7737844	585	0.3339357	0.3357169	352
21	−0.5060216	−0.4984737	−1109	−0.7778300	−0.7818160	+571	−0.3374720	−0.3392013	+346
22	0.4908879	0.4832648	1127	0.7857417	0.7896071	556	0.3409043	0.3425812	340
23	0.4756049	0.4679088	1145	0.7934119	0.7971557	541	0.3442317	0.3458557	334
24	0.4601769	0.4524100	1162	0.8008384	0.8044596	526	0.3474532	0.3490240	328
25	0.4446085	0.4367731	1180	0.8080191	0.8115166	510	0.3505680	0.3520851	322
26	−0.4289042	−0.4210026	−1197	−0.8149519	−0.8183246	+494	−0.3535752	−0.3550382	+315
27	0.4130686	0.4051030	1215	0.8216347	0.8248816	477	0.3564739	0.3578824	309
28	0.3971062	0.3890788	1232	0.8280655	0.8311857	460	0.3592632	0.3606167	302
29	0.3810214	0.3729345	1249	0.8342423	0.8372348	443	0.3619423	0.3632404	295
30	0.3648187	0.3566746	1265	0.8401631	0.8430268	425	0.3645104	0.3657526	288
Dec. 1	−0.3485028	−0.3403038	−1281	−0.8458257	−0.8485595	+407	−0.3669666	−0.3681525	+281
2	0.3320783	0.3238269	1297	0.8512280	0.8538309	388	0.3693100	0.3704392	273
3	0.3155501	0.3072486	1313	0.8563680	0.8588390	369	0.3715398	0.3726118	266
4	0.2989228	0.2905735	1329	0.8612438	0.8635821	350	0.3736551	0.3746696	258
5	0.2822012	0.2738067	1344	0.8658537	0.8680583	331	0.3756552	0.3766117	250
6	−0.2653906	−0.2569535	−1359	−0.8701957	−0.8722656	+311	−0.3775392	−0.3784373	+242
7	0.2484961	0.2400191	1374	0.8742678	0.8762022	291	0.3793062	0.3801456	234
8	0.2315230	0.2230088	1388	0.8780684	0.8798665	270	0.3809556	0.3817360	225
9	0.2144767	0.2059280	1402	0.8815961	0.8832571	249	0.3824868	0.3832078	216
10	0.1973629	0.1887825	1416	0.8848493	0.8863725	227	0.3838989	0.3845601	207
11	−0.1801872	−0.1715780	−1429	−0.8878266	−0.8892114	+205	−0.3851913	−0.3857924	+198
12	0.1629553	0.1543201	1442	0.8905268	0.8917728	182	0.3863635	0.3869044	188
13	0.1456728	0.1370144	1455	0.8929493	0.8940561	160	0.3874151	0.3878956	179
14	0.1283454	0.1196667	1467	0.8950933	0.8960606	137	0.3883458	0.3887657	169
15	0.1109788	0.1022827	1479	0.8969581	0.8977856	114	0.3891554	0.3895145	160
16	−0.0935788	−0.0848681	−1490	−0.8985432	−0.8992307	+ 90	−0.3898434	−0.3901418	+150
17	0.0761509	0.0674284	1501	0.8998482	0.9003957	67	0.3904097	0.3906473	140
18	0.0587008	0.0499693	1512	0.9008730	0.9012803	43	0.3908543	0.3910310	130
19	0.0412342	0.0324964	1522	0.9016175	0.9018846	+ 18	0.3911772	0.3912930	120
20	0.0237564	−0.0150150	1532	0.9020817	0.9022086	− 7	0.3913784	0.3914333	109
21	−0.0062727	+0.0024695	−1541	−0.9022656	−0.9022526	− 32	−0.3914578	−0.3914519	+ 99
22	+0.0112114	0.0199517	1550	0.9021697	0.9020170	57	0.3914156	0.3913490	88
23	0.0286905	0.0374265	1558	0.9017943	0.9015019	83	0.3912520	0.3911248	77
24	0.0461596	0.0548890	1566	0.9011396	0.9007076	109	0.3909673	0.3907796	66
25	0.0636141	0.0723342	1573	0.9002058	0.8996343	135	0.3905615	0.3903134	55
26	+0.0810488	+0.0897569	−1580	−0.8989931	−0.8982824	−162	−0.3900348	−0.3897264	+ 44
27	0.0984582	0.1071518	1586	0.8975021	0.8966525	189	0.3893875	0.3890187	34
28	0.1158372	0.1245137	1591	0.8957333	0.8947449	216	0.3886196	0.3881905	23
29	0.1331809	0.1418379	1596	0.8936870	0.8925599	243	0.3877313	0.3872421	+ 12
30	0.1504844	0.1591195	1601	0.8913634	0.8900977	270	0.3867228	0.3861736	− 1
31	+0.1677426	+0.1763531	−1605	−0.8887628	−0.8873589	−298	−0.3855944	−0.3849854	− 14
32	+0.1849500	+0.1935332	−1608	−0.8858859	−0.8843442	−326	−0.3843464	−0.3836776	− 26

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	JANUARY.		Day of Month.	FEBRUARY.		Day of Month.	MARCH.	
	True Longitude.	Latitude.		True Longitude.	Latitude.		True Longitude.	Latitude.
1.0	49° 23′ 18″.5	—3° 39′ 48″.7	1.0	94° 12′ 5″.7	+0° 8′ 54″.3	1.0	102° 38′ 50″.8	+1° 4′ 8″.0
1.5	55 29 12.3	3 14 9.0	1.5	100 5 23.5	0 40 51.7	1.5	108 32 5.1	1 34 21.0
2.0	61 32 23.3	2 46 29.7	2.0	105 58 43.4	1 12 20.5	2.0	114 25 44.5	2 3 33.2
2.5	67 33 15.4	2 17 9.9	2.5	111 52 28.2	1 43 2.4	2.5	120 20 19.8	2 31 27.7
3.0	73 32 11.2	1 46 29.1	3.0	117 46 58.1	2 12 39.1	3.0	126 16 18.6	2 57 47.6
3.5	79 29 32.0	—1 14 47.0	3.5	123 42 30.6	+2 40 52.2	3.5	132 14 5.1	+3 22 16.1
4.0	85 25 37.5	0 42 23.4	4.0	129 39 21.2	3 7 23.9	4.0	138 14 0.0	3 44 36.7
4.5	91 20 46.1	—0 9 38.2	4.5	135 37 43.3	3 31 56.6	4.5	144 16 20.4	4 4 32.9
5.0	97 15 15.1	+0 23 8.9	5.0	141 37 48.8	3 54 13.5	5.0	150 21 19.6	4 21 49.3
5.5	103 9 21.0	0 55 37.9	5.5	147 39 47.9	4 13 58.6	5.5	156 29 7.7	4 36 10.9
6.0	109 3 19.5	+1 27 29.3	6.0	153 43 49.7	+4 30 56.9	6.0	162 39 51.3	+4 47 23.9
6.5	114 57 26.0	1 58 23.9	6.5	159 50 3.1	4 44 54.7	6.5	168 53 34.2	4 55 16.3
7.0	120 51 55.7	2 28 3.0	7.0	165 58 36.5	4 55 39.7	7.0	175 10 17.7	4 59 37.8
7.5	126 47 4.1	2 56 8.6	7.5	172 9 38.5	5 3 1.3	7.5	181 30 0.8	5 0 20.2
8.0	132 43 7.0	3 22 23.1	8.0	178 23 18.4	5 6 50.6	8.0	187 52 41.4	4 57 18.1
8.5	138 40 20.9	+3 46 29.9	8:5	184 39 46.2	+5 7 0.5	8.5	194 18 16.5	+4 50 28.4
9.0	144 39 3.4	4 8 13.4	9.0	190 59 13.4	5 3 26.0	9.0	200 46 43.0	4 39 51.5
9.5	150 39 33.3	4 27 18.6	9.5	197 21 52.5	4 56 4.4	9.5	207 17 58.3	4 25 30.7
10.0	156 42 10.3	4 43 31.6	10.0	203 47 57.4	4 44 55.0	10.0	213 52 0.9	4 7 32.4
10.5	162 47 15.9	4 56 39.5	10.5	210 17 43.5	4 29 59.7	10.5	220 28 50.6	3 46 6.2
11.0	168 55 12.9	+5 6 30.5	11.0	216 51 26.6	+4 11 23.0	11.0	227 8 28.9	+3 21 25.1
11.5	175 6 25.2	5 12 53.4	11.5	223 29 23.0	3 49 12.3	11.5	233 50 59.1	2 53 45.4
12.0	181 21 17.9	5 15 38.7	12.0	230 11 48.7	3 23 38.2	12.0	240 36 25.8	2 23 26.2
12.5	187 40 16.3	5 14 37.9	12.5	236 58 58.9	2 54 54.5	12.5	247 24 54.9	1 50 49.5
13.0	194 3 46.5	5 9 43.9	13.0	243 51 6.4	2 23 19.1	13.0	254 16 32.8	1 16 20.9
13.5	200 32 13.7	+5 0 51.4	13.5	250 48 20.5	+1 49 13.5	13.5	261 11 25.4	+0 40 28.1
14.0	207 6 2.0	4 47 57.4	14.0	257 50 46.0	1 13 4.1	14.0	268 9 37.4	+0 3 41.7
14.5	213 45 33.3	4 31 1.2	14.5	264 58 21.7	+0 35 21.3	14.5	275 11 11.3	—0 33 25.5
15.0	220 31 6.4	4 10 5.6	15.0	272 10 58.7	—0 3 20.2	15.0	282 16 5.2	1 10 18.6
15.5	227 22 55.4	3 45 17.1	15.5	279 28 19.5	0 42 21.6	15.5	289 24 12.8	1 46 21.0
16.0	234 21 9.0	+3 16 46.7	16.0	286 49 57.0	—1 21 1.2	16.0	296 35 21.5	—2 20 55.8
16.5	241 25 48.1	2 44 51.1	16.5	294 15 13.6	1 58 35.0	16.5	303 49 12.0	2 53 26.0
17.0	248 36 45.6	2 9 52.5	17.0	301 43 22.0	2 34 18.4	17.0	311 5 17.0	3 23 15.5
17.5	255 53 44.5	1 32 19.4	17.5	309 13 25.6	3 7 28.0	17.5	318 23 1.8	3 49 50.6
18.0	263 16 16.9	0 52 46.7	18.0	316 44 20.3	3 37 23.5	18.0	325 41 44.5	4 12 41.5
18.5	270 43 44.1	+0 11 55.3	18.5	324 14 56.4	—4 3 29.4	18.5	333 0 36.4	—4 31 22.4
19.0	278 15 16.6	—0 29 29.2	19.0	331 44 1.9	4 25 16.5	19.0	340 18 45.3	4 45 33.9
19.5	285 49 54.8	1 10 37.4	19.5	339 10 25.5	4 42 23.4	19.5	347 35 15.3	4 55 3.0
20.0	293 26 30.7	1 50 38.5	20.0	346 32 59.7	4 54 37.1	20.0	354 49 10.8	4 59 43.4
20.5	301 3 50.3	2 28 42.7	20.5	353 50 43.9	5 1 52.6	20.5	1 59 38.6	4 59 36.3
21.0	308 40 36.0	—3 4 2.9	21.0	1 2 46.7	—5 4 12.9	21.0	9 5 49.6	—4 54 49.4
21.5	316 15 30.2	3 35 57.2	21.5	8 8 27.6	5 1 47.7	21.5	16 7 2.0	4 45 36.2
22.0	323 47 18.5	4 3 50.9	22.0	15 7 17.7	4 54 52.5	22.0	23 2 41.6	4 32 15.3
22.5	331 14 52.6	4 27 17.4	22.5	21 59 0.6	4 43 47.0	22.5	29 52 23.6	4 15 9.0
23.0	338 37 13.0	4 45 58.9	23.0	28 43 31.4	4 28 53.5	23.0	36 35 53.1	3 54 42.2
23.5	345 53 30.9	—4 59 45.9	23.5	35 20 55.7	—4 10 36.3	23.5	43 13 4.7	—3 31 21.4
24.0	353 3 9.4	5 8 37.0	24.0	41 51 28.4	3 49 20.4	24.0	49 44 2.3	3 5 33.5
24.5	0 5 44.0	5 12 37.6	24.5	48 15 32.7	3 25 30.2	24.5	56 8 58.1	2 37 44.9
25.0	7 1 2.3	5 11 58.3	25.0	54 33 37.7	2 59 30.0	25.0	62 28 11.7	2 8 21.4
25.5	13 49 2.8	5 6 54.3	25.5	60 46 17.7	2 31 42.9	25.5	68 42 9.1	1 37 47.5
26.0	20 29 53.9	—4 57 43.6	26.0	66 54 10.2	—2 2 30.8	26.0	74 51 21.3	—1 6 26.1
26.5	27 3 52.2	4 44 46.1	26.5	72 57 55.3	1 32 14.5	26.5	80 56 23.5	0 34 38.5
27.0	33 31 21.5	4 28 22.7	27.0	78 58 14.4	1 1 13.7	27.0	86 57 53.9	—0 2 44.9
27.5	39 52 50.6	4 8 54.5	27.5	84 55 48.9	—0 29 47.2	27.5	92 56 32.4	+0 28 56.1
28.0	46 8 52.0	3 46 42.8	28.0	90 51 20.1	+0 1 46.9	28.0	98 53 0.4	1 0 6.9
28.5	52 20 0.9	3 22 8.5	28.5	96 45 27.9	0 33 11.0	28.5	104 47 59.9	1 30 30.9
29.0	58 26 53.7	—2 55 31.8	29.0	102 38 50.8	+1 4 8.0	29.0	110 42 11.9	+1 59 51.9
29.5	64 30 7.3	2 27 12.6	29.5	108 32 5.1	1 34 21.0	29.5	116 36 17.6	2 27 54.4
30.0	70 30 18.4	1 57 30.3	30.0	114 25 44.5	2 3 33.2	30.0	122 30 56.1	2 54 23.0
30.5	76 28 2.6	1 26 43.8	30.5	120 20 19.8	2 31 27.7	30.5	128 26 44.3	3 19 2.4
31.0	82 23 54.1	0 55 11.8	31.0	126 16 18.6	2 57 47.6	31.0	134 24 16.8	3 41 37.6
31.5	88 18 25.2	—0 23 13.0	31.5	132 14 5.1	+3 22 16.1	31.5	140 24 5.5	+4 1 53.5

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	APRIL.		Day of Month.	MAY.		Day of Month.	JUNE.	
	True Longitude.	Latitude.		True Longitude.	Latitude.		True Longitude.	Latitude.
1.0	146° 26′ 38″.2	+4° 19′ 35″.2	1.0	179° 17′ 48″.2	+5° 7′ 50″.0	1.0	227° 20′ 23″.3	+3° 8′ 38″.6
1.5	152 32 19.3	4 34 27.8	1.5	185 43 2.4	5 3 10.7	1.5	234 21 19.5	2 36 10.8
2.0	158 41 28.6	4 46 17.2	2.0	192 13 18.1	4 54 33.9	2.0	241 27 21.7	2 0 54.3
2.5	164 54 21.3	4 54 50.3	2.5	198 48 36.9	4 41 57.0	2.5	248 37 58.0	1 23 19.8
3.0	171 11 8.1	4 59 55.1	3.0	205 28 54.2	4 25 20.9	3.0	255 52 30.4	0 44 3.3
3.5	177 31 54.3	+5 1 21.4	3.5	212 13 59.5	+4 4 50.8	3.5	263 10 15.0	+0 3 45.4
4.0	183 56 41.2	4 59 0.9	4.0	219 3 36.8	3 40 36.6	4.0	270 30 24.2	—0 36 50.1
4.5	190 25 25.4	4 52 48.3	4.5	225 57 24.6	3 12 53.6	4.5	277 52 7.6	1 16 58.1
5.0	196 57 58.7	4 42 41.5	5.0	232 54 57.5	2 42 1.9	5.0	285 14 34.5	1 55 53.1
5.5	203 34 10.5	4 28 41.9	5.5	239 55 46.7	2 8 26.8	5.5	292 36 54.5	2 32 51.5
6.0	210 13 47.3	+4 10 54.9	6.0	246 59 21.2	+1 32 38.2	6.0	299 58 19.4	—3 7 12.9
6.5	216 56 33.5	3 49 30.0	6.5	254 5 8.9	0 55 10.0	6.5	307 18 5.1	3 38 21.5
7.0	223 42 12.6	3 24 40.9	7.0	261 12 37.8	+0 16 38.8	7.0	314 35 32.2	4 5 47.0
7.5	230 30 28.1	2 56 45.4	7.5	268 21 16.8	—0 22 16.5	7.5	321 50 6.4	4 29 5.0
8.0	237 21 4.2	2 26 5.3	8.0	275 30 36.6	1 0 56.1	8.0	329 1 19.4	4 47 57.6
8.5	244 13 46.7	+1 53 5.6	8.5	282 40 10.2	—1 38 40.7	8.5	336 8 48.8	—5 2 13.2
9.0	251 8 23.0	1 18 14.8	9.0	289 49 33.3	2 14 52.2	9.0	343 12 18.1	5 11 45.8
9.5	258 4 42.6	0 42 3.4	9.5	296 58 24.4	2 48 54.7	9.5	350 11 36.0	5 16 34.8
10.0	265 2 36.8	+0 5 4.0	10.0	304 6 24.6	3 20 15.5	10.0	357 6 36.0	5 16 44.4
10.5	272 1 58.7	—0 32 9.3	10.5	311 13 17.1	3 48 25.4	10.5	3 57 15.7	5 12 23.2
11.0	279 2 42.7	—1 9 1.8	11.0	318 18 47.3	—4 12 59.2	11.0	10 43 36.3	—5 3 43.0
11.5	286 4 43.5	1 44 58.6	11.5	325 22 42.1	4 33 36.3	11.5	17 25 41.7	4 50 58.8
12.0	293 7 55.6	2 19 25.4	12.0	332 24 49.3	4 50 0.5	12.0	24 3 37.8	4 34 28.0
12.5	300 12 12.0	2 51 48.9	12.5	339 24 57.2	5 2 0.0	12.5	30 37 32.4	4 14 29.9
13.0	307 17 23.9	3 21 37.4	13.0	346 22 54.6	5 9 28.1	13.0	37 7 34.2	3 51 25.7
13.5	314 23 19.6	—3 48 21.7	13.5	353 18 30.0	—5 12 22.5	13.5	43 33 52.5	—3 25 37.8
14.0	321 29 43.8	4 11 35.2	14.0	0 11 32.0	5 10 45.1	14.0	49 56 37.2	2 57 29.3
14.5	328 36 17.2	4 30 55.3	14.5	7 1 48.8	5 4 42.5	14.5	56 15 58.5	2 27 24.4
15.0	335 42 36.6	4 46 3.3	15.0	13 49 8.9	4 54 24.9	15.0	62 32 6.9	1 55 47.2
15.5	342 48 15.2	4 56 45.4	15.5	20 33 21.1	4 40 6.4	15.5	68 45 13.0	1 23 2.0
16.0	349 52 42.7	—5 2 52.8	16.0	27 14 14.7	—4 22 4.5	16.0	74 55 27.6	—0 49 33.1
16.5	356 55 26.8	5 4 22.4	16.5	33 51 40.3	4 0 39.0	16.5	81 3 2.1	—0 15 44.0
17.0	3 55 53.6	5 1 16.5	17.0	40 25 29.7	3 36 12.5	17.0	87 8 8.3	+0 18 2.2
17.5	10 53 29.8	4 53 42.6	17.5	46 55 37.1	3 9 9.4	17.5	93 10 58.9	0 51 23.4
18.0	17 47 43.4	4 41 53.6	18.0	53 21 58.3	2 39 55.1	18.0	99 11 47.5	1 23 58.7
18.5	24 38 5.2	—4 26 6.6	18.5	59 44 32.7	—2 8 55.4	18.5	105 10 48.9	+1 55 28.2
19.0	31 24 10.3	4 6 42.4	19.0	66 3 22.1	1 36 36.5	19.0	111 8 19.3	2 25 33.4
19.5	38 5 38.9	3 44 4.9	19.5	72 18 31.6	1 3 24.4	19.5	117 4 36.2	2 53 57.1
20.0	44 42 16.7	3 18 39.8	20.0	78 30 9.8	—0 29 43.9	20.0	122 59 58.9	3 20 23.5
20.5	51 13 56.2	2 50 54.1	20.5	84 38 28.5	+0 4 1.1	20.5	128 54 48.2	3 44 38.0
21.0	57 40 35.8	—2 21 14.8	21.0	90 43 42.9	+0 37 28.0	21.0	134 49 26.9	+4 6 27.3
21.5	64 2 20.6	1 50 8.9	21.5	96 46 11.3	1 10 15.6	21.5	140 44 19.6	4 25 39.3
22.0	70 19 21.7	1 18 2.4	22.0	102 46 15.1	1 42 4.3	22.0	146 39 52.6	4 42 2.7
22.5	76 31 55.5	0 45 20.1	22.5	108 44 18.7	2 12 36.1	22.5	152 36 33.8	4 55 27.5
23.0	82 40 23.9	—0 12 24.9	23.0	114 40 48.9	2 41 34.2	23.0	158 34 52.6	5 5 44.2
23.5	88 45 13.0	+0 20 21.4	23.5	120 36 14.9	+3 8 43.2	23.5	164 35 19.9	+5 12 44.2
24.0	94 46 52.7	0 52 38.7	24.0	126 31 7.9	3 33 48.7	24.0	170 38 27.5	5 16 19.8
24.5	100 45 55.9	1 24 8.4	24.5	132 26 0.9	3 56 37.3	24.5	176 44 47.7	5 16 23.9
25.0	106 42 58.1	1 54 33.4	25.0	138 21 28.4	4 16 56.5	25.0	182 54 52.8	5 12 50.6
25.5	112 38 36.6	2 23 37.8	25.5	144 18 5.5	4 34 34.3	25.5	189 9 14.7	5 5 34.7
26.0	118 33 29.9	+2 51 6.3	26.0	150 16 28.0	+4 49 19.1	26.0	195 28 24.6	+4 54 32.8
26.5	124 28 17.2	3 16 44.3	26.5	156 17 11.7	5 0 59.7	26.5	201 52 51.4	4 39 43.2
27.0	130 23 37.8	3 40 18.0	27.0	162 20 52.1	5 9 25.5	27.0	208 23 1.1	4 21 6.4
27.5	136 20 10.6	4 1 33.8	27.5	168 28 3.3	5 14 26.6	27.5	214 59 16.1	3 58 45.8
28.0	142 18 33.2	4 20 18.2	28.0	174 39 17.8	5 15 53.3	28.0	221 41 53.7	3 32 48.7
28.5	148 19 21.8	4 36 17.9	28.5	180 55 5.3	5 13 36.9	28.5	228 31 5.1	3 3 26.5
29.0	154 23 10.3	+4 49 20.1	29.0	187 15 53.0	+5 7 30.3	29.0	235 26 54.1	+2 30 55.4
29.5	160 30 29.9	4 59 12.0	29.5	193 42 3.5	4 57 28.1	29.5	242 29 16.4	1 55 37.4
30.0	166 41 48.0	5 5 41.6	30.0	200 13 54.3	4 43 27.3	30.0	249 37 58.0	1 18 0.2
30.5	172 57 27.9	5 8 37.6	30.5	206 51 37.8	4 25 27.8	30.5	256 52 35.5	+0 38 37.4
31.0	179 17 48.2	5 7 50.0	31.0	213 35 19.4	4 3 33.4	31.0	264 12 35.3	—0 1 51.7
31.5	185 43 2.4	+5 3 10.7	31.5	220 24 57.7	+3 37 52.5	31.5	271 37 13.8	—0 42 43.4

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	JULY.		Day of Month.	AUGUST.		Day of Month.	SEPTEMBER.	
	True Longitude.	Latitude.		True Longitude.	Latitude.		True Longitude.	Latitude.
1.0	264° 12′ 35″.3	−0° 1′ 51″.7	1.0	317° 50′ 41″.6	−4° 12′ 10″.4	1.0	11° 10′ 40″.2	−4° 41′ 36″.4
1.5	271 37 13.8	0 42 43.4	1.5	325 28 30.5	4 33 24.1	1.5	18 22 33.6	4 25 57.6
2.0	279 5 38.2	1 23 10.6	2.0	333 4 0.7	4 49 40.5	2.0	25 27 17.4	4 6 26.3
2.5	286 36 48.4	2 2 24.5	2.5	340 35 56.4	5 0 46.4	2.5	32 24 34.1	3 43 32.8
3.0	294 9 38.7	2 39 37.3	3.0	348 3 10.4	5 6 37.8	3.0	39 14 19.4	3 17 48.7
3.5	301 42 59.9	−3 14 3.5	3.5	355 24 46.5	−5 7 19.0	3.5	45 56 40.2	−2 49 45.5
4.0	309 15 42.0	3 45 2.1	4.0	2 40 0.8	5 3 1.9	4.0	52 31 52.9	2 19 53.4
4.5	316 46 37.3	4 11 58.6	4.5	9 48 22.1	4 54 4.0	4.5	59 0 21.9	1 48 41.2
5.0	324 14 42.8	4 34 26.1	5.0	16 49 32.7	4 40 47.7	5.0	65 22 37.4	1 16 35.8
5.5	331 39 1.8	4 52 5.6	5.5	23 43 26.8	4 23 38.1	5.5	71 39 14.1	0 44 1.9
6.0	338 58 47.0	−5 4 46.2	6.0	30 30 8.9	−4 3 2.0	6.0	77 50 50.2	−0 11 22.2
6.5	346 13 20.0	5 12 24.7	6.5	37 9 53.0	3 39 27.3	6.5	83 58 4.6	+0 21 2.3
7.0	353 22 12.8	5 15 4.8	7.0	43 43 0.3	3 13 21.2	7.0	90 1 37.5	0 52 52.2
7.5	0 25 7.5	5 12 56.1	7.5	50 9 57.5	2 45 10.3	7.5	96 2 8.4	1 23 49.6
8.0	7 21 55.4	5 6 12.5	8.0	56 31 15.5	2 15 20.3	8.0	102 0 16.1	1 53 37.9
8.5	14 12 36.2	−4 55 12.0	8.5	62 47 27.5	−1 44 15.7	8.5	107 56 37.1	+2 22 1.3
9.0	20 57 16.7	4 40 14.8	9.0	68 59 8.4	1 12 20.0	9.0	113 51 46.3	2 48 45.0
9.5	27 36 9.9	4 21 42.9	9.5	75 6 53.5	0 39 55.1	9.5	119 46 16.0	3 13 34.7
10.0	34 9 33.0	3 59 59.4	10.0	81 11 16.8	−0 7 21.8	10.0	125 40 35.4	3 36 16.7
10.5	40 37 47.0	3 35 28.0	10.5	87 12 52.3	+0 24 59.7	10.5	131 35 10.6	3 56 38.4
11.0	47 1 15.0	−3 8 32.5	11.0	93 12 11.1	+0 56 50.3	11.0	137 30 25.0	+4 14 27.5
11.5	53 20 21.2	2 39 36.7	11.5	99 9 42.9	1 27 51.6	11.5	143 26 38.5	4 29 32.4
12.0	59 35 30.5	2 9 4.0	12.0	105 5 55.1	1 57 45.9	12.0	149 24 8.2	4 41 42.7
12.5	65 47 7.8	1 37 17.6	12.5	111 1 12.3	2 26 16.6	12.5	155 23 8.1	4 50 49.2
13.0	71 55 37.0	1 4 40.4	13.0	116 55 56.6	2 53 7.3	13.0	161 23 49.8	4 56 43.7
13.5	78 1 21.1	−0 31 34.4	13.5	122 50 27.9	+3 18 2.6	13.5	167 26 22.6	+4 59 19.7
14.0	84 4 41.7	+0 1 38.8	14.0	128 45 3.8	3 40 47.8	14.0	173 30 53.7	4 58 32.4
14.5	90 5 59.1	0 34 37.9	14.5	134 39 59.6	4 1 9.2	14.5	179 37 29.3	4 54 19.0
15.0	96 5 32.3	1 7 2.6	15.0	140 35 29.1	4 18 54.5	15.0	185 46 14.4	4 46 38.7
15.5	102 3 38.8	1 38 33.2	15.5	146 31 44.9	4 33 52.0	15.5	191 57 13.9	4 35 32.9
16.0	108 0 35.1	+2 8 51.0	16.0	152 28 57.8	+4 45 51.7	16.0	198 10 32.8	+4 21 5.4
16.5	113 56 36.7	2 37 38.2	16.5	158 27 19.2	4 54 45.0	16.5	204 26 17.1	4 3 22.3
17.0	119 51 58.5	3 4 38.0	17.0	164 26 59.4	5 0 24.5	17.0	210 44 33.9	3 42 32.3
17.5	125 46 55.1	3 29 34.8	17.5	170 28 9.7	5 2 44.8	17.5	217 5 31.7	3 18 46.4
18.0	131 41 41.2	3 52 14.0	18.0	176 31 1.7	5 1 41.9	18.0	223 29 21.0	2 52 17.9
18.5	137 36 31.6	+4 12 22.5	18.5	182 35 48.5	+4 57 13.4	18.5	229 56 14.5	+2 23 22.8
19.0	143 31 41.8	4 29 48.3	19.0	188 42 44.7	4 49 19.1	19.0	236 26 26.2	1 52 19.2
19.5	149 27 28.2	4 44 21.0	19.5	194 52 6.6	4 38 0.1	19.5	243 0 11.9	1 19 27.7
20.0	155 24 8.6	4 55 51.0	20.0	201 4 12.4	4 23 19.6	20.0	249 37 48.2	0 45 11.1
20.5	161 22 2.1	5 4 10.4	20.5	207 19 22.2	4 5 22.5	20.5	256 19 32.3	+0 9 54.6
21.0	167 21 29.3	+5 9 12.3	21.0	213 37 58.2	+3 44 16.0	21.0	263 5 40.2	−0 25 54.1
21.5	173 22 52.9	5 10 51.0	21.5	220 0 24.0	3 20 8.9	21.5	269 56 26.6	1 1 45.2
22.0	179 26 37.0	5 9 2.1	22.0	226 27 4.1	2 53 12.7	22.0	276 52 2.8	1 37 6.8
22.5	185 33 7.5	5 3 42.6	22.5	232 58 23.8	2 23 41.5	22.5	283 52 35.6	2 11 25.3
23.0	191 42 51.8	4 54 50.6	23.0	239 34 47.7	1 51 51.8	23.0	290 58 5.7	2 44 5.9
23.5	197 56 18.2	+4 42 25.6	23.5	246 16 39.2	+1 18 4.0	23.5	298 8 26 3	−3 14 32.5
24.0	204 13 56.1	4 26 29.0	24.0	253 4 18.9	0 42 41.0	24.0	305 23 21.5	3 42 9.8
24.5	210 36 14.7	4 7 3.8	24.5	259 58 3.2	+0 6 10.0	24.5	312 42 25.8	4 6 23.7
25.0	217 3 43.0	3 44 15.6	25.0	266 58 2.8	−0 30 58.3	25.0	320 5 3.4	4 26 42.5
25.5	223 36 48.2	3 18 12.5	25.5	274 4 20.8	1 8 9.7	25.5	327 30 28.2	4 42 39.0
26.0	230 15 55.1	+2 49 5.8	26.0	281 16 51.1	−1 44 46.3	26.0	334 57 44.8	−4 53 51.0
26.5	237 1 24.8	2 17 10.9	26.5	288 35 16.5	2 20 7.8	26.5	342 25 50.9	5 0 3.3
27.0	243 53 32.9	1 42 47.1	27.0	295 59 8.5	2 53 32.2	27.0	349 53 38.7	5 1 8.1
27.5	250 52 28.5	1 6 18.9	27.5	303 27 45.3	3 24 17.4	27.5	357 19 58.4	4 57 5.9
28.0	257 58 12.4	+0 28 15.4	28.0	311 0 13.4	3 51 42.8	28.0	4 43 40.8	4 48 5.5
28.5	265 10 35.4	−0 10 48.8	28.5	318 35 27.7	4 15 11.5	28.5	12 3 41.4	4 34 22.7
29.0	272 29 17.2	−0 50 14.3	29.0	326 12 14.4	−4 34 11.4	29.0	19 19 2.0	−4 16 20.3
29.5	279 53 46.0	1 29 17.8	29.5	333 49 13.0	4 48 18.6	29.5	26 28 53.8	3 54 26.0
30.0	287 23 17.2	2 7 13.3	30.0	341 25 0.5	4 57 16.7	30.0	33 32 38.7	3 29 11.1
30.5	294 56 54.8	2 43 12.9	30.5	348 58 15.2	5 0 59.2	30.5	40 29 50.0	3 1 9.2
31.0	302 33 32.4	3 16 30.4	31.0	356 27 40.4	4 59 28.2	31.0	47 20 12.3	2 30 54.4
31.5	310 11 54.9	−3 46 22.2	31.5	3 52 7.7	−4 52 54.6	31.5	54 3 41.3	−1 59 0.0

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	OCTOBER. True Longitude.	OCTOBER. Latitude.	Day of Month.	NOVEMBER. True Longitude.	NOVEMBER. Latitude.	Day of Month.	DECEMBER. True Longitude.	DECEMBER. Latitude.
1.0	47° 20′ 12″.3	−2° 30′ 54″.4	1.0	93° 55′ 23″.1	+1° 40′ 41″.7	1.0	126° 0′ 17″.5	+4° 7′ 48″.7
1.5	54 3 41.3	1 59 0.0	1.5	100 4 59.9	2 11 52.6	1.5	131 58 40.4	4 27 2.8
2.0	60 40 23.0	1 25 58.1	2.0	106 10 50.2	2 41 14.6	2.0	137 55 39.2	4 43 19.4
2.5	67 10 32.1	0 52 18.5	2.5	112 13 27.2	3 8 32.9	2.5	143 51 45.8	4 56 31.5
3.0	73 34 30.7	−0 18 28.8	3.0	118 13 26.0	3 33 34.7	3.0	149 47 34.0	5 6 33.0
3.5	79 52 47.1	+0 15 6.3	3.5	124 11 23.5	+3 56 8.6	3.5	155 43 38.6	+5 13 18.7
4.0	86 5 54.1	0 48 4.4	4.0	130 7 57.4	4 16 4.2	4.0	161 40 35.2	5 16 44.4
4.5	92 14 27.9	1 20 5.6	4.5	136 3 45.2	4 33 12.5	4.5	167 38 59.4	5 16 46.0
5.0	98 19 7.0	1 50 52.0	5.0	141 59 24.5	4 47 24.9	5.0	173 39 26.8	5 13 20.5
5.5	104 20 31.3	2 20 7.5	5.5	147 55 32.0	4 58 33.7	5.5	179 42 32.2	5 6 25.7
6.0	110 19 21.1	+2 47 37.6	6.0	153 52 43.2	+5 6 31.7	6.0	185 48 49.0	+4 56 0.5
6.5	116 16 16.0	3 13 8.8	6.5	159 51 31.6	5 11 12.3	6.5	191 58 48.6	4 42 5.1
7.0	122 11 55.1	3 36 28.8	7.0	165 52 28.7	5 12 29.6	7.0	198 13 0.2	4 24 41.3
7.5	128 6 56.0	3 57 25.9	7.5	171 56 2.9	5 10 18.7	7.5	204 31 49.4	4 3 52.9
8.0	134 1 53.9	4 15 49.1	8.0	178 2 39.8	5 4 35.9	8.0	210 55 37.8	3 39 46.4
8.5	139 57 21.7	+4 31 28.2	8.5	184 12 41.5	+4 55 18.9	8.5	217 24 42.3	+3 12 31.7
9.0	145 53 49.5	4 44 13.4	9.0	190 26 26.0	4 42 27.3	9.0	223 59 14.5	2 42 22.1
9.5	151 51 44.6	4 53 55.5	9.5	196 44 7.3	4 26 2.9	9.5	230 39 19.9	2 9 35.0
10.0	157 51 30.7	5 0 26.4	10.0	203 5 55.0	4 6 10.4	10.0	237 24 57.5	1 34 32.2
10.5	163 53 27.9	5 3 38.6	10.5	209 31 54.2	3 42 57.6	10.5	244 15 59.1	0 57 40.1
11.0	169 57 53.1	+5 3 26.5	11.0	216 2 5.6	+3 16 35.7	11.0	251 12 9.8	+0 19 29.6
11.5	176 4 59.2	4 59 45.7	11.5	222 36 25.8	2 47 19.7	11.5	258 13 7.6	−0 19 24.5
12.0	182 14 56.1	4 52 33.7	12.0	229 14 47.5	2 15 28.7	12.0	265 18 23.8	0 58 23.9
12.5	188 27 50.2	4 41 50.1	12.5	235 56 59.6	1 41 25.6	12.5	272 27 24.3	1 36 48.2
13.0	194 43 44.9	4 27 37.1	13.0	242 42 48.3	1 5 36.9	13.0	279 39 29.9	2 13 55.9
13.5	201 2 41.7	+4 10 0.0	13.5	249 31 57.2	+0 28 32.6	13.5	286 53 57.6	−2 49 5.9
14.0	207 24 39.7	3 49 6.5	14.0	256 24 8.4	−0 9 14.7	14.0	294 10 2.4	3 21 38.7
14.5	213 49 36.4	3 25 7.6	14.5	263 19 2.8	0 47 10.4	14.5	301 26 58.5	3 50 58.2
15.0	220 17 28.8	2 58 17.7	15.0	270 16 21.0	1 24 38.2	15.0	308 44 1.0	4 16 33.0
15.5	226 48 13.5	2 28 54.0	15.5	277 15 43.3	2 1 2.0	15.5	316 0 27.4	4 37 56.8
16.0	233 21 47.5	+1 57 16.7	16.0	284 16 50.6	−2 35 46.0	16.0	323 15 38.3	−4 54 49.4
16.5	239 58 8.5	1 23 49.0	16.5	291 19 24.8	3 8 15.7	16.5	330 28 58.7	5 6 56.7
17.0	246 37 15.4	0 48 56.3	17.0	298 23 8.3	3 37 58.9	17.0	337 39 59.0	5 14 11.2
17.5	253 19 8.2	+0 13 6.2	17.5	305 27 44.5	4 4 26.1	17.5	344 48 14.8	5 16 31.1
18.0	260 3 48.2	−0 23 12.0	18.0	312 32 57.4	4 27 11.5	18.0	351 53 26.9	5 14 0.3
18.5	266 51 17.6	−0 59 27.4	18.5	319 38 31.6	−4 45 52.9	18.5	358 55 21.3	−5 6 47.5
19.0	273 41 39.1	1 35 8.3	19.0	326 44 11.5	5 0 12.5	19.0	5 53 48.5	4 55 6.0
19.5	280 34 55.6	2 9 42.2	19.5	333 49 41.9	5 9 57.2	19.5	12 48 43.0	4 39 12.5
20.0	287 31 8.9	2 42 36.7	20.0	340 54 46.8	5 14 58.4	20.0	19 40 2.6	4 19 27.1
20.5	294 30 19.4	3 13 20.2	20.5	347 59 9.5	5 15 12.5	20.5	26 27 47.8	3 56 12.3
21.0	301 32 24.6	−3 41 20.9	21.0	355 2 32.4	−5 10 40.9	21.0	33 12 0.8	−3 29 52.5
21.5	308 37 17.9	4 6 9.7	21.5	2 4 37.1	5 1 30.0	21.5	39 52 45.3	3 0 54.1
22.0	315 44 49.0	4 27 19.2	22.0	9 5 4.3	4 47 50.8	22.0	46 30 5.7	2 29 44.3
22.5	322 54 41.5	4 44 25.0	22.5	16 3 34.3	4 29 58.9	22.5	53 4 6.6	1 56 51.2
23.0	330 6 33.4	4 57 6.6	23.0	22 59 46.8	4 8 14.3	23.0	59 34 52.8	1 22 43.1
23.5	337 19 56.9	−5 5 8.1	23.5	29 53 21.7	−3 43 0.5	23.5	66 2 28.9	−0 47 48.4
24.0	344 34 18.3	5 8 18.8	24.0	36 43 59.7	3 14 44.2	24.0	72 26 59.3	−0 12 34.9
24.5	351 48 58.4	5 6 33.9	24.5	43 31 22.9	2 43 54.5	24.5	78 48 28.4	+0 22 30.2
25.0	359 3 14.2	4 59 55.1	25.0	50 15 14.8	2 11 2.1	25.0	85 7 0.7	0 57 1.0
25.5	6 16 19.9	4 48 30.6	25.5	56 55 21.7	1 36 39.0	25.5	91 22 40.9	1 30 33.1
26.0	13 27 28.6	−4 32 34.9	26.0	63 31 32.5	−1 1 16.9	26.0	97 35 34.3	+2 2 43.9
26.5	20 35 54.6	4 12 28.3	26.5	70 3 39.6	−0 25 26.8	26.5	103 45 47.2	2 33 12.7
27.0	27 40 54.5	3 48 35.9	27.0	76 31 38.9	+0 10 21.4	27.0	109 53 27.2	3 1 40.8
27.5	34 41 49.6	3 21 27.3	27.5	82 55 30.3	0 45 39.5	27.5	115 58 43.2	3 27 51.7
28.0	41 38 6.8	2 51 34.6	28.0	89 15 17.7	1 20 1.8	28.0	122 1 45.9	3 51 31.2
28.5	48 29 19.8	2 19 31.6	28.5	95 31 8.8	1 53 4.8	28.5	128 2 48.4	4 12 27.2
29.0	55 15 10.0	−1 45 52.4	29.0	101 43 15.3	+2 24 27.7	29.0	134 2 5.7	+4 30 29.6
29.5	61 55 25.7	1 11 10.5	29.5	107 51 52.8	2 53 52.3	29.5	139 59 55.2	4 45 30.1
30.0	68 30 4.4	0 35 57.8	30.0	113 57 20.4	3 21 2.7	30.0	145 56 37.0	4 57 22.3
30.5	74 59 9.7	−0 0 44.3	30.5	120 0 0.2	3 45 45.4	30.5	151 52 33.7	5 6 1.1
31.0	81 22 52.4	+0 34 2.6	31.0	126 0 17.5	4 7 48.7	31.0	157 48 10.3	5 11 22.7
31.5	87 41 29.5	+1 7 58.5	31.5	131 58 40.4	+4 27 2.8	31.5	163 43 54.1	+5 13 24.6

FOR GREENWICH MEAN NOON.

Date.	THE MOON'S EQUATOR.			☾ Mean Longitude of the Moon.
	i Inclination to Earth's Equator.	△ Ascend'g Node on Earth's Equator to Ascending Node on Ecliptic.	☊′ Ascend'g Node on Earth's Equator.	
	° ′	° ′	° ′	° ′
Jan. 0	23 33.8	275 57.7	356 18.0	30 14.6
10	23 33.0	275 26.2	356 17.8	162 0.4
20	23 32.2	274 54.7	356 17.7	293 46.2
30	23 31.3	274 23.2	356 17.5	65 32.1
Feb. 9	23 30.5	273 51.6	356 17.4	197 17.9
19	23 29.7	273 20.0	356 17.2	329 3.8
March 1	23 28.8	272 48.4	356 17.1	100 49.6
11	23 28.0	272 16.8	356 17.0	232 35.5
21	23 27.2	271 45.3	356 16.9	4 21.3
31	23 26.4	271 13.7	356 16.9	136 7.1
April 10	23 25.6	270 42.1	356 16.8	267 53.0
20	23 24.8	270 10.4	356 16.8	39 38.8
30	23 24.0	269 38.7	356 16.8	171 24.6
May 10	23 23.2	269 7.0	356 16.8	303 10.5
20	23 22.3	268 35.2	356 16.9	74 56.3
30	23 21.5	268 3.4	356 16.9	206 42.1
June 9	23 20.7	267 31.6	356 17.0	338 28.0
19	23 19.8	266 59.7	356 17.1	110 13.8
29	23 19.0	266 27.8	356 17.2	241 59.7
July 9	23 18.2	265 55.9	356 17.4	13 45.5
19	23 17.4	265 24.0	356 17.5	145 31.3
29	23 16.6	264 52.1	356 17.6	277 17.2
Aug. 8	23 15.8	264 20.2	356 17.8	49 3.0
18	23 15.0	263 48.3	356 18.0	180 48.8
28	23 14.2	263 16.3	356 18.3	312 34.7
Sept. 7	23 13.4	262 44.3	356 18.6	84 20.5
17	23 12.5	262 12.3	356 18.9	216 6.4
27	23 11.7	261 40.2	356 19.2	347 52.2
Oct. 7	23 10.9	261 8.1	356 19.5	119 38.0
17	23 10.1	260 36.0	356 19.8	251 23.9
27	23 9.3	260 3.9	356 20.1	23 9.7
Nov. 6	23 8.5	259 31.8	356 20.5	154 55.5
16	23 7.7	258 59.7	356 20.9	286 41.4
26	23 6.9	258 27.6	356 21.3	58 27.2
Dec. 6	23 6.1	257 55.4	356 21.8	190 13.0
16	23 5.3	257 23.2	356 22.2	321 58.9
26	23 4.5	256 51.0	356 22.7	93 44.7
36	23 3.7	256 18.7	356 23.2	225 30.6

Mean Solar Days.	Motion of ☾
	° ′
0.1	1 19.06
0.2	2 38.12
0.3	3 57.18
0.4	5 16.23
0.5	6 35.29
0.6	7 54.35
0.7	9 13.41
0.8	10 32.47
0.9	11 51.53
1.0	13 10.58
2.0	26 21.17
3.0	39 31.75
4.0	52 42.33
5.0	65 52.92
6.0	79 3.50
7.0	92 14.09
8.0	105 24.67
9.0	118 35.25
10.0	131 45.84
Hours.	° ′
1	0 32.94
2	1 5.88
3	1 38.82
4	2 11.76
5	2 44.70
6	3 17.65
7	3 50.59
8	4 23.53
9	4 56.47
10	5 29.41
11	6 2.35
12	6 35.29
13	7 8.23
14	7 41.17
15	8 14.11
16	8 47.06
17	9 20.00
18	9 52.94
19	10 25.88
20	10 58.82
21	11 31.76
22	12 4.70
23	12 37.64

TABLE FOR THE LIBRATION OF THE MOON.

Argument, (☊—λ) or (☊—λ—180°).

☊ − λ	Δλ	$\frac{1}{a}$	B		☊ − λ	Δλ	$\frac{1}{a}$	B	
0°	0′.0	39	0° 0′.0	180°	46°	0′.6	56	1° 3′.9	134°
1	0.0	39	0 1.6	179	47	0.6	57	1 4.9	133
2	0.0	39	0 3.1	178	48	0.6	58	1 6.0	132
3	0.1	39	0 4.7	177	49	0.6	59	1 7.0	131
4	0.1	39	0 6.2	176	50	0.6	60	1 8.0	130
5	0.1	39	0 7.7	175	51	0.6	62	1 9.0	129
6	0.2	39	0 9.3	174	52	0.6	63	1 10.0	128
7	0.2	39	0 10.8	173	53	0.5	64	1 10.9	127
8	0.2	39	0 12.4	172	54	0.5	66	1 11.8	126
9	0.2	39	0 13.9	171	55	0.5	67	1 12.7	125
10	0.2	39	0 15.4	170	56	0.5	69	1 13.6	124
11	0.3	39	0 16.9	169	57	0.5	71	1 14.5	123
12	0.3	40	0 18.5	168	58	0.5	73	1 15.3	122
13	0.3	40	0 20.0	167	59	0.5	75	1 16.1	121
14	0.3	40	0 21.5	166	60	0.5	77	1 16.9	120
15	0.3	40	0 23.0	165	61	0.5	80	1 17.6	119
16	0.3	40	0 24.5	164	62	0.5	83	1 18.4	118
17	0.3	40	0 26.0	163	63	0.5	86	1 19.1	117
18	0.3	41	0 27.4	162	64	0.5	89	1 19.8	116
19	0.4	41	0 28.9	161	65	0.4	92	1 20.4	115
20	0.4	41	0 30.4	160	66	0.4	95	1 21.1	114
21	0.4	41	0 31.8	159	67	0.4	99	1 21.7	113
22	0.4	42	0 33.2	158	68	0.4	103	1 22.3	112
23	0.4	42	0 34.7	157	69	0.4	108	1 22.9	111
24	0.4	42	0 36.1	156	70	0.4	113	1 23.4	110
25	0.4	43	0 37.5	155	71	0.4	119	1 23.9	109
26	0.5	43	0 38.9	154	72	0.4	125	1 24.4	108
27	0.5	43	0 40.3	153	73	0.4	132	1 24.9	107
28	0.5	44	0 41.7	152	74	0.3	141	1 25.3	106
29	0.5	44	0 43.1	151	75	0.3	150	1 25.7	105
30	0.5	45	0 44.4	150	76	0.3	160	1 26.1	104
31	0.5	45	0 45.7	149	77	0.3	172	1 26.5	103
32	0.5	46	0 47.0	148	78	0.2	186	1 26.8	102
33	0.5	46	0 48.4	147	79	0.2	202	1 27.1	101
34	0.5	47	0 49.7	146	80	0.2	222	1 27.4	100
35	0.5	47	0 51.0	145	81	0.2	247	1 27.7	99
36	0.5	48	0 52.2	144	82	0.2	278	1 27.9	98
37	0.5	48	0 53.4	143	83	0.1	318	1 28.1	97
38	0.6	49	0 54.7	142	84	0.1	370	1 28.3	96
39	0.6	50	0 55.9	141	85	0.1	440	1 28.5	95
40	0.6	50	0 57.1	140	86	0.1	555	1 28.6	94
41	0.6	51	0 58.3	139	87	0.1	740	1 28.7	93
42	0.6	52	0 59.4	138	88	0.0	1110	1 28.7	92
43	0.6	53	1 0.6	137	89	0.0	2220	1 28.8	91
44	0.6	54	1 1.7	136	90	0.0	∞	1 28.8	90
45	0.6	55	1 2.8	135					
	Δλ	$\frac{1}{a}$	B	☊ − λ		Δλ	$\frac{1}{a}$	B	☊ − λ

Δλ has the sign of tan (λ — ☊)
a has the sign of cos (☊ — λ)
B has the sign of sin (☊ — λ)

FOR GREENWICH MEAN NOON.

Date.	Apparent Obliquity of the Ecliptic. (Hansen.)	Equation of Equinoxes		Precession of Equinoxes in Longitude.	The Sun's		Mean Longitude of Moon's Ascending Node.
		In Longitude.	In R. A.		Aberration.	Hor. Par.	
	° ′ ″	″	s	″	″	″	° ′
Jan. 0	23 27 11.88	– 16.88	– 1.032	0.00	– 20.80	9.00	92 34.1
10	12.04	16.50	1.009	1.38	20.79	9.00	92 2.4
20	12.25	16.22	0.992	2.75	20.77	8.99	91 30.6
30	12.51	16.09	0.984	4.13	20.74	8.98	90 58.8
Feb. 9	12.78	16.09	0.984	5.50	20.71	8.96	90 27.0
19	23 27 13.03	– 16.25	– 0.994	6.88	– 20.67	8.94	89 55.3
March 1	13.24	16.54	1.012	8.26	20.63	8.92	89 23.5
11	13.40	16.91	1.034	9.63	20.57	8.90	88 51.7
21	13.50	17.32	1.059	11.01	20.51	8.87	88 20.0
31	13.54	17.74	1.085	12.38	20.45	8.85	87 48.2
April 10	23 27 13.52	– 18.09	– 1.106	13.76	– 20.39	8.82	87 16.4
20	13.45	18.34	1.122	15.14	20.34	8.80	86 44.6
30	13.34	18.47	1.130	16.51	20.29	8.78	86 12.9
May 10	13.24	18.46	1.129	17.89	20.24	8.76	85 41.1
20	13.15	18.31	1.120	19.26	20.19	8.74	85 9.3
30	23 27 13.08	– 18.03	– 1.103	20.64	– 20.16	8.72	84 37.6
June 9	13.06	17.65	1.079	22.02	20.13	8.71	84 5.8
19	13.09	17.23	1.054	23.39	20.11	8.71	83 34.0
29	13.18	16.81	1.028	24.77	20.11	8.70	83 2.2
July 9	13.32	16.42	1.004	26.14	20.10	8.70	82 30.5
19	23 27 13.51	– 16.09	– 0.984	27.52	– 20.12	8.71	81 58.7
29	13.74	15.88	0.971	28.90	20.14	8.72	81 26.9
Aug. 8	13.99	15.79	0.966	30.27	20.17	8.73	80 55.2
18	14.24	15.83	0.968	31.65	20.20	8.75	80 23.4
28	14.46	16.01	0.979	33.02	20.24	8.77	79 51.6
Sept. 7	23 27 14.65	– 16.30	– 0.997	34.40	– 20.29	8.79	79 19.8
17	14.79	16.66	1.019	35.78	20.35	8.81	78 48.1
27	14.86	17.06	1.043	37.15	20.41	8.84	78 16.3
Oct. 7	14.87	17.43	1.066	38.53	20.47	8.87	77 44.5
17	14.82	17.73	1.084	39.90	20.53	8.88	77 12.7
27	23 27 14.73	– 17.92	– 1.096	41.28	– 20.59	8.91	76 41.0
Nov. 6	14.62	17.96	1.098	42.66	20.64	8.93	76 9.2
16	14.51	17.85	1.091	44.03	20.69	8.95	75 37.4
26	14.41	17.60	1.076	45.41	20.73	8.97	75 5.7
Dec. 6	14.35	17.23	1.054	46.78	20.76	8.98	74 33.9
16	23 27 14.35	– 16.77	– 1.026	48.16	– 20.78	8.99	74 2.1
26	14.42	16.28	0.995	49.54	20.79	9.00	73 30.3
36	23 27 14.55	– 15.81	– 0.967	50.91	– 20.79	9.00	72 58.6

Mean Obliquity, 1890.0, 23° 27′ 12″.68 (Hansen).
Mean Obliquity, 1890.0, 23° 27′ 12″.42 (Peters).

Precession for 1890	50″.2615	log 1.70124
Precession in a Solar Day	0″.1376	log 9.13863
Precession in a Sidereal Day	0″.1372	log 9.13744
Sun's Mean Equatorial Horizontal Parallax .	8″.848	log 0.94685

Daily Motion of ☊ —3′.1773

PART II

ASTRONOMICAL EPHEMERIS

FOR THE

MERIDIAN OF WASHINGTON

FORMULÆ FOR THE REDUCTION OF THE POSITIONS OF THE FIXED STARS, USING THE NOTATION OF BESSEL, AND THE CONSTANTS OF PETERS AND STRUVE.

NOTATION.

τ, the time, reckoned in units of one year, from the beginning of the Besselian fictitious year, (1889, December $30^d.680$ = 1890, January $0^d.0 - 0^d.320$, Washington mean time),

α_0, δ_0, the star's mean right ascension and declination at the beginning of the fictitious year,

α, δ, the star's apparent right ascension and declination at the time τ,

μ, μ', the annual proper motion in right ascension and declination,

$\odot$, the sun's true longitude,

Ω, the longitude of the moon's ascending node,

ω, the obliquity of the ecliptic,

Γ, the longitude of the sun's perigee,

Γ', the longitude of the moon's perigee,

☾, the moon's mean longitude.

BESSELIAN STAR-NUMBERS.

$$\begin{array}{llll}
A = \tau & - 0.34249 \sin \Omega & & - 0.00011 \sin (3 \odot - \Gamma) \\
& + 0.00410 \sin 2 \Omega & & - 0.00005 \sin 2 (\odot - \Omega) \\
& - 0.02521 \sin 2 \odot & & + 0.00010 \sin 2 (\odot - \Gamma') \\
& + 0.00293 \sin (\odot + 82^\circ\ 4') & & + 0.00009 \sin (2 \Gamma' - \Omega) \\
& + 0.00025 \sin (2 \odot - \Omega) & & + 0.00005 \cos \Gamma' \\
& - 0.00405 \sin 2\,\text{☾} & & + 0.00004 \sin 2 \Gamma' \\
& + 0.00135 \sin (\text{☾} - \Gamma') & &
\end{array}$$

$$\begin{array}{llll}
B = & - 9''.2239 \cos \Omega & & - 0''.0027 \cos (3 \odot - \Gamma) \\
& + 0.0895 \cos 2 \Omega & & + 0.0067 \cos (2 \odot - \Omega) \\
& - 0.5506 \cos 2 \odot & & + 0.0024 \cos (2 \Gamma' - \Omega) \\
& - 0.0092 \cos (\odot + 281^\circ\ 3') & & - 0.0023 \sin \Gamma' \\
& - 0.0886 \cos 2\,\text{☾} & & + 0.0008 \cos 2 \Gamma'
\end{array}$$

$$C = - 20''.4451 \cos \omega \cos \odot$$
$$D = - 20.4451 \sin \odot$$
$$E = - 0.0461 \sin \Omega + 0''.0014 \sin 2 \Omega - 0''.0033 \sin 2 \odot$$

BESSEL'S *Star-Constants.*

$a = 3^s.07253 + 1^s.33687 \sin \alpha_0 \tan \delta_0$ = precession in right ascension

$b = \frac{1}{15} \cos \alpha_0 \tan \delta_0$

$c = \frac{1}{15} \cos \alpha_0 \sec \delta_0$

$d = \frac{1}{15} \sin \alpha_0 \sec \delta_0$

$a' = 20''.0529 \cos \alpha_0$ = precession in declination

$b' = - \sin \alpha_0$

$c' = \tan \omega \cos \delta_0 - \sin \alpha_0 \sin \delta_0$

$d' = \cos \alpha_0 \sin \delta_0$

Reduction to Apparent Position.

$\alpha = \alpha_0 + \tau\mu + Aa + Bb + Cc + Dd + E$ (in time)

$\delta = \delta_0 + \tau\mu' + Aa' + Bb' + Cc' + Dd'$ (in arc)

INDEPENDENT STAR-NUMBERS.

$f = 46''.0879\ A + E$ (in arc) $= 3^s.07253\ A + \frac{1}{15} E$ (in time)

$g \sin G = B$ $\qquad h \sin H = C$

$g \cos G = 20''.0529\ A$ $\qquad h \cos H = D$ $\qquad i = C \tan \omega$

Reduction to Apparent Position.

$\alpha = \alpha_0 + f + \tau\mu + \frac{1}{15} g \sin (G + \alpha_0) \tan \delta_0 + \frac{1}{15} h \sin (H + \alpha_0) \sec \delta_0$ (in time)

$\delta = \delta_0 + \tau\mu' + g \cos (G + \alpha_0) + h \cos (H + \alpha_0) \sin \delta_0 + i \cos \delta_0$ (in arc)

NOTES.—(1) The independent star-numbers are more convenient, when only one or two apparent positions of a star are required, or when BESSEL's star-constants are not known with sufficient accuracy. Otherwise, the Besselian star-numbers are more convenient.

(2) In using the star-constants of the *British Association Catalogue*, $a, b, c, d, a', b', c', d'$, must be changed to $c, d, a, b, -c', -d', -a', -b'$, respectively.

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.
Jan. 1	−9.5185	+9.9282	−0.5847	+1.3013	Feb. 15	−9.2726	−9.3570	−1.1993	+1.0403
2	9.5128	9.9376	0.6201	1.2996	16	9.2631	9.4502	1.2041	1.0281
3	9.5063	9.9404	0.6527	1.2977	17	9.2553	9.5388	1.2087	1.0153
4	9.4994	9.9344	0.6828	1.2957	18	9.2496	9.6141	1.2131	1.0020
$(7^{h}.0)$ 5	9.4925	9.9184	0.7109	1.2936	19	9.2458	9.6722	1.2173	0.9882
6	−9.4860	+9.8928	−0.7372	+1.2913	$(10^{h}.0)$ 20	−9.2437	−9.7117	−1.2213	+0.9739
7	9.4806	9.8593	0.7617	1.2889	21	9.2424	9.7335	1.2251	0.9590
8	9.4763	9.8214	0.7848	1.2864	22	9.2409	9.7399	1.2288	0.9433
9	9.4730	9.7839	0.8067	1.2837	23	9.2384	9.7343	1.2324	0.9268
10	9.4704	9.7530	0.8275	1.2808	24	9.2343	9.7212	1.2358	0.9095
11	−9.4683	+9.7336	−0.8471	+1.2777	25	−9.2282	−9.7070	−1.2390	+0.8915
12	9.4658	9.7277	0.8657	1.2744	26	9.2202	9.6988	1.2421	0.8726
13	9.4624	9.7336	0.8834	1.2710	27	9.2109	9.7025	1.2450	0.8527
14	9.4580	9.7461	0.9003	1.2675	28	9.2009	9.7209	1.2477	0.8316
15	9.4521	9.7582	0.9164	1.2638	Mar. 1	9.1914	9.7519	1.2503	0.8093
16	−9.4449	+9.7640	−0.9318	+1.2600	2	−9.1835	−9.7906	−1.2528	+0.7858
17	9.4367	9.7586	0.9466	1.2560	3	9.1776	9.8302	1.2551	0.7610
18	9.4280	9.7389	0.9608	1.2518	4	9.1740	9.8658	1.2572	0.7345
19	9.4195	9.7029	0.9744	1.2474	5	9.1724	9.8931	1.2592	0.7060
$(8^{h}.0)$ 20	9.4118	9.6498	0.9874	1.2428	6	9.1722	9.9105	1.2611	0.6751
21	−9.4053	+9.5805	−0.9997	+1.2381	$(11^{h}.0)$ 7	−9.1721	−9.9176	−1.2629	+0.6418
22	9.4003	9.4987	1.0116	1.2331	8	9.1711	9.9150	1.2646	0.6059
23	9.3967	9.4130	1.0231	1.2279	9	9.1682	9.9051	1.2661	0.5665
24	9.3940	9.3369	1.0342	1.2225	10	9.1628	9.8914	1.2674	0.5231
25	9.3917	9.2896	1.0450	1.2170	11	9.1544	9.8783	1.2685	0.4743
26	−9.3892	+9.2794	−1.0554	+1.2113	12	−9.1436	−9.8704	−1.2695	+0.4200
27	9.3857	9.2960	1.0653	1.2054	13	9.1312	9.8715	1.2704	0.3574
28	9.3807	9.3228	1.0749	1.1992	14	9.1181	9.8828	1.2712	0.2842
29	9.3743	9.3416	1.0841	1.1928	15	9.1057	9.9026	1.2718	0.1959
30	9.3668	9.3387	1.0930	1.1861	16	9.0952	9.9276	1.2723	0.0850
31	−9.3585	+9.3008	−1.1016	+1.1792	17	−9.0873	−9.9529	−1.2727	+9.9352
Feb. 1	9.3501	9.2127	1.1099	1.1721	18	9.0826	9.9748	1.2729	9.7054
2	9.3423	9.0394	1.1179	1.1647	19	9.0802	9.9903	1.2730	+9.1776
3	9.3358	+8.6503	1.1256	1.1570	20	9.0792	9.9978	1.2730	−9.3000
$(9^{h}.0)$ 4	9.3309	−8.3838	1.1330	1.1491	21	9.0785	9.9969	1.2729	9.7433
5	−9.3276	−8.9455	−1.1402	+1.1409	$(12^{h}.0)$ 22	−9.0766	−9.9889	−1.2727	−9.9580
6	9.3256	9.1458	1.1471	1.1324	23	9.0726	9.9748	1.2724	0.1006
7	9.3239	9.2425	1.1538	1.1236	24	9.0654	9.9587	1.2719	0.2076
8	9.3222	9.2851	1.1603	1.1144	25	9.0553	9.9444	1.2712	0.2933
9	9.3197	9.2882	1.1665	1.1049	26	9.0430	9.9354	1.2704	0.3647
10	−9.3158	−9.2655	−1.1725	+1.0951	27	−9.0290	−9.9348	−1.2694	−0.4257
11	9.3099	9.2333	1.1783	1.0849	28	9.0151	9.9430	1.2683	0.4793
12	9.3022	9.2125	1.1839	1.0743	29	9.0026	9.9584	1.2671	0.5267
13	9.2930	9.2232	1.1893	1.0633	30	8.9930	9.9773	1.2658	0.5694
14	9.2829	9.2749	1.1944	1.0520	31	8.9868	9.9959	1.2644	0.6080
15	−9.2726	−9.3570	−1.1993	+1.0403	Apr. 1	−8.9835	−0.0107	−1.2628	−0.6432
16	−9.2631	−9.4502	−1.2041	+.10281	2	−8.9828	−0.0192	−1.2611	−0.6756

From January 1 to March 16, E = − 0″.04

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.
Apr. 1	−8.9835	−0.0107	−1.2628	−0.6432	May 17	+8.1113	−9.7985	−1.0071	−1.2351
2	8.9828	0.0192	1.2611	0.6756	18	8.2127	9.7643	0.9955	1.2398
3	8.9828	0.0200	1.2592	0.7059	19	8.3105	9.7339	0.9835	1.2443
4	8.9818	0.0131	1.2572	0.7342	20	8.3991	9.7140	0.9711	1.2485
5	8.9781	9.9996	1.2551	0.7605	21	8.4745	9.7089	0.9582	1.2525
$(13^{\mathrm{h}}.0)$ 6	−8.9706	−9.9814	−1.2529	−0.7848	$(16^{\mathrm{h}}.0)$ 22	+8.5359	−9.7190	−0.9447	−1.2564
7	8.9586	9.9619	1.2506	0.8078	23	8.5835	9.7404	0.9306	1.2602
8	8.9420	9.9450	1.2481	0.8297	24	8.6188	9.7661	0.9160	1.2639
9	8.9217	9.9347	1.2454	0.8504	25	8.6433	9.7899	0.9009	1.2674
10	8.8992	9.9332	1.2425	0.8700	26	8.6600	9.8062	0.8852	1.2707
11	−8.8763	−9.9405	−1.2395	−0.8886	27	+8.6728	−9.8121	−0.8687	−1.2738
12	8.8555	9.9541	1.2364	0.9062	28	8.6848	9.8061	0.8513	1.2768
13	8.8382	9.9703	1.2332	0.9231	29	8.6997	9.7880	0.8330	1.2797
14	8.8259	9.9855	1.2298	0.9393	30	8.7201	9.7599	0.8139	1.2825
15	8.8181	9.9959	1.2262	0.9548	31	8.7464	9.7257	0.7939	1.2852
16	−8.8136	−9.9994	−1.2225	−0.9696	June 1	+8.7779	−9.6915	−0.7727	−1.2877
17	8.8099	9.9948	1.2187	0.9837	2	8.8124	9.6647	0.7502	1.2900
18	8.8044	9.9818	1.2147	0.9973	3	8.8474	9.6527	0.7264	1.2922
19	8.7953	9.9624	1.2105	1.0104	4	8.8802	9.6589	0.7011	1.2943
20	8.7807	9.9391	1.2061	1.0229	5	8.9095	9.6807	0.6742	1.2963
$(14^{\mathrm{h}}.0)$ 21	−8.7594	−9.9157	−1.2015	−1.0349	$(17^{\mathrm{h}}.0)$ 6	+8.9329	−9.7120	−0.6454	−1.2981
22	8.7314	9.8965	1.1968	1.0465	7	8.9518	9.7452	0.6143	1.2998
23	8.6984	9.8855	1.1919	1.0577	8	8.9659	9.7732	0.5808	1.3014
24	8.6622	9.8845	1.1868	1.0685	9	8.9766	9.7918	0.5444	1.3029
25	8.6265	9.8930	1.1816	1.0789	10	8.9851	9.7986	0.5043	1.3042
26	−8.5944	−9.9075	−1.1762	−1.0888	11	+8.9936	−9.7929	−0.4602	−1.3054
27	8.5688	9.9239	1.1706	1.0984	12	9.0034	9.7759	0.4109	1.3065
28	8.5513	9.9375	1.1648	1.1077	13	9.0156	9.7507	0.3552	1.3074
29	8.5403	9.9450	1.1588	1.1167	14	9.0305	9.7220	0.2913	1.3082
30	8.5327	9.9440	1.1525	1.1254	15	9.0478	9.6970	0.2160	1.3089
May 1	−8.5235	−9.9342	−1.1460	−1.1337	16	+9.0666	−9.6822	−0.1248	−1.3095
2	8.5073	9.9153	1.1393	1.1417	17	9.0854	9.6835	0.0090	1.3100
3	8.4793	9.8896	1.1324	1.1495	18	9.1030	9.7016	9.8507	1.3104
4	8.4352	9.8604	1.1253	1.1571	19	9.1184	9.7318	9.5983	1.3106
5	8.3694	9.8327	1.1180	1.1645	20	9.1308	9.7678	−8.9220	1.3106
6	−8.2774	−9.8115	−1.1104	−1.1716	$(18^{\mathrm{h}}.0)$ 21	+9.1405	−9.8023	+9.3586	−1.3106
$(15^{\mathrm{h}}.0)$ 7	8.1486	9.8014	1.1025	1.1784	22	9.1473	9.8303	9.7322	1.3105
8	7.9652	9.8038	1.0943	1.1850	23	9.1526	9.8486	9.9302	1.3102
9	7.6785	9.8165	1.0859	1.1914	24	9.1573	9.8558	0.0657	1.3098
10	−7.0086	9.8352	1.0772	1.1975	25	9.1626	9.8523	0.1687	1.3093
11	+7.2878	−9.8544	−1.0682	−1.2034	26	+9.1694	−9.8402	+0.2518	−1.3087
12	7.6107	9.8682	1.0589	1.2091	27	9.1783	9.8228	0.3214	1.3079
13	7.7520	9.8741	1.0492	1.2146	28	9.1899	9.8051	0.3813	1.3070
14	7.8420	9.8698	1.0392	1.2199	29	9.2034	9.7930	0.4338	1.3060
15	7.9243	9.8548	1.0289	1.2251	30	9.2179	9.7911	0.4804	1.3049
16	+8.0137	−9.8302	−1.0182	−1.2302	July 1	+9.2322	−9.8024	+0.5226	−1.3037
17	+8.1113	−9.7985	−1.0071	−1.2351	2	+9.2459	−9.8253	+0.5608	−1.3024

From March 17 to June 24, E = − 0″.05

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log *A.*	Log *B.*	Log *C.*	Log *D.*	Solar Day. (Sid. Hour.)	Log *A.*	Log *B.*	Log *C.*	Log *D.*
July 1	+9.2322	−9.8024	+0.5226	−1.3037	Aug. 16	+9.4959	−0.2708	+1.1821	−1.0774
2	9.2459	9.8253	0.5608	1.3024	17	9.4966	0.2797	1.1873	1.0671
3	9.2577	9.8559	0.5958	1.3009	18	9.4972	0.2843	1.1923	1.0565
4	9.2674	9.8885	0.6281	1.2993	19	9.4983	0.2849	1.1972	1.0455
5	9.2749	9.9185	0.6580	1.2975	20	9.5002	0.2827	1.2019	1.0341
h 6	+9.2805	−9.9420	+0.6859	−1.2056	h (22.0) 21	+9.5033	−0.2791	+1.2064	−1.0222
(19.0) 7	9.2849	9.9572	0.7121	1.2936	22	9.5075	0.2762	1.2107	1.0098
8	9.2889	9.9638	0.7367	1.2915	23	9.5127	0.2757	1.2148	0.9968
9	9.2934	9.9621	0.7598	1.2892	24	9.5184	0.2788	1.2188	0.9833
10	9.2990	9.9545	0.7816	1.2868	25	9.5241	0.2860	1.2227	0.9693
11	+9.3059	−9.9446	+0.8023	−1.2843	26	+9.5292	−0.2966	+1.2264	−0.9547
12	9.3144	9.9360	0.8220	1.2817	27	9.5336	0.3094	1.2299	0.9394
13	9.3240	9.9329	0.8407	1.2789	28	9.5367	0.3226	1.2332	0.9234
14	9.3340	9.9383	0.8584	1.2759	29	9.5388	0.3344	1.2364	0.9068
15	9.3437	9.9520	0.8752	1.2728	30	9.5400	0.3434	1.2395	0.8894
16	+9.3524	−9.9748	+0.8914	−1.2696	31	+9.5407	−0.3489	+1.2424	−0.8710
17	9.3597	0.0010	0.9069	1.2663	Sept. 1	9.5414	0.3507	1.2452	0.8516
18	9.3652	0.0275	0.9217	1.2628	2	9.5425	0.3493	1.2478	0.8312
19	9.3691	0.0510	0.9360	1.2591	3	9.5444	0.3458	1.2503	0.8097
20	9.3719	0.0690	0.9497	1.2552	4	9.5472	0.3416	1.2527	0.7869
h 21	+9.3740	−0.0805	+0.9628	−1.2512	h (23.0) 5	+9.5508	−0.3385	+1.2549	−0.7626
(20.0) 22	9.3763	0.0858	0.9755	1.2471	6	9.5550	0.3378	1.2570	0.7368
23	9.3793	0.0852	0.9877	1.2428	7	9.5594	0.3405	1.2590	0.7093
24	9.3836	0.0809	0.9994	1.2383	8	9.5636	0.3467	1.2609	0.6801
25	9.3896	0.0753	1.0107	1.2337	9	9.5671	0.3555	1.2626	0.6483
26	+9.3969	−0.0716	+1.0216	−1.2289	10	+9.5698	−0.3659	+1.2642	−0.6138
27	9.4051	0.0724	1.0321	1.2239	11	9.5714	0.3760	1.2656	0.5762
28	9.4136	0.0796	1.0423	1.2187	12	9.5721	0.3845	1.2669	0.5348
29	9.4219	0.0932	1.0521	1.2133	13	9.5721	0.3904	1.2681	0.4889
30	9.4293	0.1118	1.0616	1.2076	14	9.5721	0.3929	1.2692	0.4380
31	+9.4354	−0.1329	+1.0707	−1.2018	15	+9.5722	−0.3921	+1.2701	−0.3789
Aug. 1	9.4400	0.1537	1.0795	1.1958	16	9.5731	0.3887	1.2709	0.3109
2	9.4433	0.1717	1.0881	1.1896	17	9.5748	0.3837	1.2716	0.2302
3	9.4457	0.1851	1.0964	1.1833	18	9.5775	0.3786	1.2722	0.1310
4	9.4475	0.1932	1.1044	1.1769	19	9.5812	0.3749	1.2726	0.0015
h 5	+9.4495	−0.1959	+1.1122	−1.1702	h (0.0) 20	+9.5856	−0.3738	+1.2724	−9.8158
(21.0) 6	9.4521	0.1945	1.1197	1.1631	21	9.5901	0.3758	1.2731	9.4839
7	9.4557	0.1910	1.1270	1.1558	22	9.5943	0.3810	1.2731	−8.6000
8	9.4604	0.1875	1.1340	1.1482	23	9.5979	0.3884	1.2731	+9.5947
9	9.4661	0.1863	1.1407	1.1404	24	9.6006	0.3966	1.2729	9.8714
10	+9.4723	−0.1893	+1.1472	−1.1322	25	+9.6024	−0.4043	+1.2725	+0.0387
11	9.4784	0.1972	1.1535	1.1238	26	9.6034	0.4102	1.2720	0.1593
12	9.4841	0.2097	1.1597	1.1151	27	9.6039	0.4132	1.2714	0.2535
13	9.4888	0.2255	1.1657	1.1062	28	9.6043	0.4131	1.2706	0.3308
14	9.4924	0.2422	1.1714	1.0970	29	9.6049	0.4099	1.2696	0.3963
15	+9.4947	−0.2579	+1.1768	−1.0874	30	+9.6062	−0.4045	+1.2686	+0.4532
16	+9.4959	−0.2708	+1.1821	−1.0774	Oct. 1	+9.6083	−0.3980	+1.2675	+0.5034

E = − 0″.4.

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.
Oct. 1	+9.6083	−0.3980	+1.2678	+0.5034	Nov. 16	+9.7206	−0.3274	+1.0332	+1.2232
2	9.6112	0.3919	1.2665	0.5482	17	9.7241	0.3328	1.0222	1.2284
3	9.6147	0.3875	1.2651	0.5888	18	9.7269	0.3390	1.0106	1.2335
4	9.6184	0.3858	1.2636	0.6258	19	9.7290	0.3441	0.9985	1.2384
5	9.6222	0.3874	1.2620	0.6597	$(4^{\mathrm{h}}.0)$ 20	9.7307	0.3469	0.9860	1.2431
$(1^{\mathrm{h}}.0)$ 6	+9.6255	−0.3917	+1.2602	+0.6913	21	+9.7321	−0.3464	+0.9731	+1.2476
7	9.6281	0.3980	1.2583	0.7204	22	9.7335	0.3424	0.9598	1.2520
8	9.6298	0.4047	1.2562	0.7475	23	9.7353	0.3353	0.9457	1.2562
9	9.6308	0.4104	1.2540	0.7731	24	9.7375	0.3260	0.9309	1.2602
10	9.6311	0.4139	1.2517	0.7973	25	9.7404	0.3161	0.9155	1.2640
11	+9.6312	−0.4145	+1.2492	+0.8201	26	+9.7439	−0.3074	+0.8994	+1.2677
12	9.6314	0.4119	1.2465	0.8415	27	9.7477	0.3015	0.8827	1.2712
13	9.6320	0.4065	1.2437	0.8615	28	9.7517	0.2994	0.8651	1.2746
14	9.6334	0.3993	1.2408	0.8806	29	9.7555	0.3014	0.8465	1.2778
15	9.6359	0.3913	1.2377	0.8989	30	9.7589	0.3068	0.8269	1.2808
16	+9.6392	−0.3842	+1.2345	+0.9164	Dec. 1	+9.7618	−0.3140	+0.8063	+1.2837
17	9.6431	0.3792	1.2311	0.9331	2	9.7640	0.3215	0.7846	1.2864
18	9.6473	0.3773	1.2275	0.9491	3	9.7656	0.3274	0.7617	1.2889
19	9.6515	0.3787	1.2237	0.9644	4	9.7668	0.3304	0.7371	1.2913
20	9.6552	0.3827	1.2198	0.9790	$(5^{\mathrm{h}}.0)$ 5	9.7680	0.3300	0.7107	1.2936
$(2^{\mathrm{h}}.0)$ 21	+9.6582	−0.3883	+1.2158	+0.9930	6	+9.7693	−0.3260	+0.6826	+1.2957
22	9.6605	0.3938	1.2116	1.0065	7	9.7710	0.3191	0.6528	1.2977
23	9.6620	0.3980	1.2072	1.0195	8	9.7734	0.3106	0.6207	1.2996
24	9.6630	0.3996	1.2026	1.0320	9	9.7764	0.3023	0.5855	1.3013
25	9.6639	0.3981	1.1978	1.0440	10	9.7801	0.2958	0.5470	1.3028
26	+9.6648	−0.3934	+1.1928	+1.0555	11	+9.7840	−0.2927	+0.5046	+1.3042
27	9.6662	0.3860	1.1876	1.0666	12	9.7881	0.2938	0.4572	1.3055
28	9.6682	0.3771	1.1823	1.0772	13	9.7920	0.2988	0.4045	1.3066
29	9.6710	0.3681	1.1768	1.0875	14	9.7955	0.3069	0.3440	1.3076
30	9.6745	0.3604	1.1710	1.0975	15	9.7985	0.3162	0.2733	1.3084
31	+9.6784	−0.3554	+1.1650	+1.1072	16	+9.8009	−0.3250	+0.1887	+1.3091
Nov. 1	9.6823	0.3539	1.1587	1.1165	17	9.8027	0.3317	0.0824	1.3097
2	9.6859	0.3557	1.1522	1.1255	18	9.8043	0.3354	9.9442	1.3101
3	9.6890	0.3600	1.1454	1.1342	19	9.8058	0.3356	9.7372	1.3104
4	9.6914	0.3654	1.1384	1.1426	$(6^{\mathrm{h}}.0)$ 20	9.8074	0.3324	+9.3270	1.3106
$(3^{\mathrm{h}}.0)$ 5	+9.6931	−0.3704	+1.1312	+1.1507	21	+9.8095	−0.3268	−9.0766	+1.3106
6	9.6942	0.3736	1.1238	1.1585	22	9.8120	0.3203	9.6565	1.3105
7	9.6949	0.3739	1.1162	1.1659	23	9.8151	0.3146	9.8959	1.3102
8	9.6956	0.3708	1.1083	1.1731	24	9.8185	0.3113	0.0493	1.3098
9	9.6967	0.3645	1.1000	1.1801	25	9.8220	0.3116	0.1623	1.3093
10	+9.6984	−0.3556	+1.0914	+1.1869	26	+9.8255	−0.3160	−0.2517	+1.3086
11	9.7009	0.3457	1.0825	1.1935	27	9.8287	0.3239	0.3259	1.3078
12	9.7041	0.3361	1.0734	1.2000	28	9.8314	0.3340	0.3888	1.3068
13	9.7080	0.3287	1.0639	1.2062	29	9.8336	0.3447	0.4439	1.3057
14	9.7123	0.3246	1.0540	1.2121	30	9.8353	0.3543	0.4926	1.3045
15	+9.7166	−0.3242	+1.0438	+1.2178	31	+9.8365	−0.3616	−0.5362	+1.3032
16	+9.7206	−0.3274	+1.0332	+1.2232	32	+9.8375	−0.3656	−0.5757	+1.3017

E = − $0''.4$.

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f		G		H		Log g.	Log h.	i	Log i.
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	″	s	° ′	h m	° ′	h m			″	
Jan. 1	0.0050	−15.25	−1.017	172 42	11 30.8	349 8	23 16.5	+0.8242	+1.3091	−1.67	−0.2222
2	0.0077	15.05	1.003	172 27	11 29.8	348 12	23 12.8	0.8188	1.3088	1.81	0.2575
3	0.0105	14.83	0.989	172 17	11 29.1	347 16	23 9.1	0.8125	1.3085	1.95	0.2901
4	0.0132	14.59	0.973	172 16	11 29.1	346 20	23 5.3	0.8056	1.3082	2.09	0.3203
(7^{h}.●) 5	0.0160	14.36	0.958	172 25	11 29.7	345 23	23 1.5	0.7985	1.3079	2.23	0.3483
6	0.0187	−14.15	−0.943	172 45	11 31.0	344 26	22 57.7	+0.7917	+1.3076	−2.37	−0.3744
7	0.0214	13.98	0.932	173 12	11 32.8	343 29	22 53.9	0.7859	1.3073	2.51	0.3990
8	0.0242	13.84	0.923	173 42	11 34.8	342 32	22 50.1	0.7811	1.3069	2.65	0.4223
9	0.0269	13.74	0.916	174 10	11 36.7	341 34	22 46.3	0.7775	1.3065	2.78	0.4443
10	0.0297	13.65	0.910	174 32	11 38.1	340 37	22 42.5	0.7746	1.3061	2.91	0.4649
11	0.0324	−13.59	−0.906	174 45	11 39.0	339 39	22 38.6	+0.7723	+1.3057	−3.04	−0.4843
12	0.0351	13.51	0.901	174 48	11 39.2	338 42	22 34.8	0.7698	1.3053	3.18	0.5029
13	0.0379	13.41	0.894	174 41	11 38.7	337 44	22 30.9	0.7665	1.3048	3.31	0.5207
14	0.0406	13.27	0.885	174 28	11 37.9	336 46	22 27.1	0.7622	1.3043	3.45	0.5377
15	0.0434	13.09	0.873	174 14	11 36.9	335 48	22 23.2	0.7565	1.3038	3.58	0.5538
16	0.0461	−12.87	−0.858	174 4	11 36.3	334 50	22 19.3	+0.7494	+1.3033	−3.71	−0.5691
17	0.0488	12.64	0.843	174 2	11 36.1	333 52	22 15.5	0.7413	1.3028	3.84	0.5837
18	0.0516	12.39	0.826	174 10	11 36.7	332 54	22 11.6	0.7325	1.3023	3.97	0.5978
19	0.0543	12.15	0.809	174 32	11 38.1	331 56	22 7.7	0.7237	1.3018	4.10	0.6114
(8^{h}.●) 20	0.0571	11.94	0.796	175 4	11 40.3	330 58	22 3.9	0.7156	1.3012	4.22	0.6245
21	0.0598	−11.76	−0.784	175 44	11 42.9	329 59	21 59.9	+0.7087	+1.3006	−4.34	−0.6371
22	0.0625	11.63	0.775	176 25	11 45.7	329 0	21 56.0	0.7033	1.3000	4.46	0.6492
23	0.0652	11.53	0.769	177 2	11 48.1	328 1	21 52.1	0.6995	1.2994	4.58	0.6607
24	0.0680	11.46	0.764	177 30	11 50.0	327 2	21 48.1	0.6966	1.2988	4.70	0.6718
25	0.0707	11.41	0.761	177 45	11 51.0	326 3	21 44.2	0.6942	1.2982	4.82	0.6825
26	0.0734	−11.33	−0.755	177 47	11 51.1	325 4	21 40.3	+0.6917	+1.2976	−4.93	−0.6928
27	0.0761	11.24	0.749	177 41	11 50.7	324 4	21 36.3	0.6883	1.2970	5.04	0.7027
28	0.0789	11.12	0.741	177 30	11 50.0	323 4	21 32.3	0.6833	1.2964	5.15	0.7122
29	0.0816	10.95	0.730	177 21	11 49.4	322 5	21 28.3	0.6770	1.2958	5.26	0.7214
30	0.0844	10.76	0.717	177 20	11 49.3	321 5	21 24.3	0.6695	1.2951	5.37	0.7303
31	0.0871	−10.56	−0.704	177 30	11 50.0	320 5	21 20.3	+0.6611	+1.2944	−5.48	−0.7390
Feb. 1	0.0898	10.36	0.691	177 55	11 51.7	319 5	21 16.3	0.6526	1.2938	5.58	0.7474
2	0.0926	10.18	0.679	178 35	11 54.3	318 4	21 12.3	0.6447	1.2931	5.69	0.7554
3	0.0953	10.02	0.668	179 25	11 57.7	317 4	21 8.3	0.6381	1.2925	5.79	0.7631
(9^{h}.●) 4	0.0981	9.91	0.661	180 19	12 1.3	316 3	21 4.2	0.6331	1.2918	5.89	0.7705
5	0.1008	− 9.84	−0.656	181 11	12 4.7	315 3	21 0.2	+0.6299	+1.2911	−5.99	−0.7776
6	0.1035	9.79	0.653	181 53	12 7.5	314 2	20 56.1	0.6280	1.2904	6.09	0.7845
7	0.1063	9.75	0.650	182 22	12 9.5	313 1	20 52.1	0.6265	1.2898	6.19	0.7912
8	0.1090	9.72	0.648	182 37	12 10.5	311 59	20 47.9	0.6249	1.2891	6.28	0.7977
9	0.1118	9.66	0.644	182 39	12 10.6	310 58	20 43.9	0.6224	1.2884	6.37	0.8039
10	0.1145	− 9.57	−0.638	182 33	12 10.2	309 56	20 39.7	+0.6184	+1.2878	−6.46	−0.8099
11	0.1172	9.44	0.629	182 24	12 9.6	308 54	20 35.6	0.6125	1.2871	6.55	0.8157
12	0.1200	9.28	0.619	182 20	12 9.3	307 52	20 31.5	0.6048	1.2865	6.63	0.8213
13	0.1227	9.09	0.606	182 26	12 9.7	306 50	20 27.3	0.5956	1.2858	6.71	0.8267
14	0.1255	8.89	0.593	182 48	12 11.2	305 48	20 23.2	0.5859	1.2852	6.79	0.8318
15	0.1282	− 8.67	−0.578	183 28	12 13.9	304 45	20 19.0	+0.5756	+1.2846	−6.87	−0.8367
16	0.1309	− 8.48	−0.565	184 23	12 17.5	303 42	20 14.8	+0.5666	+1.2840	−6.95	−0.8415

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	*f*		*G*		*H*		Log *g*.	Log *h*.	*i*	Log *i*.
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	″	s	° ′	h m	° ′	h m			″	
Feb. 15	0.1282	−8.67	−0.578	183 28	12 13.9	304 45	20 19.0	+0.5756	+1.2846	−6.87	−0.8367
16	0.1309	8.48	0.565	184 23	12 17.5	303 42	20 14.8	0.5666	1.2840	6.95	0.8415
17	0.1337	8.34	0.556	185 25	12 21.7	302 39	20 10.6	0.5594	1.2834	7.02	0.8461
18	0.1364	8.23	0.549	186 35	12 26.3	301 36	20 6.4	0.5547	1.2828	7.09	0.8505
19	0.1392	8.16	0.544	187 35	12 30.3	300 33	20 2.2	0.5518	1.2822	7.16	0.8547
(10^{h}.0) 20	0.1419	−8.12	−0.541	188 20	12 33.3	299 30	19 58.0	+0.5505	+1.2817	−7.23	−0.8587
21	0.1446	8.09	0.539	188 46	12 35.1	298 27	19 53.8	0.5497	1.2811	7.29	0.8626
22	0.1474	8.07	0.538	188 56	12 35.7	297 23	19 49.5	0.5484	1.2806	7.35	0.8663
23	0.1501	8.02	0.535	188 53	12 35.5	296 19	19 45.3	0.5458	1.2800	7.41	0.8699
24	0.1529	7.95	0.530	188 42	12 34.8	295 15	19 41.0	0.5415	1.2795	7.47	0.8733
25	0.1556	−7.84	−0.523	188 32	12 34.1	294 11	19 36.7	+0.5352	+1.2790	−7.52	−0.8765
26	0.1583	7.69	0.513	188 32	12 34.1	293 7	19 32.5	0.5272	1.2785	7.57	0.8796
27	0.1611	7.52	0.502	188 48	12 35.2	292 3	19 28.2	0.5182	1.2780	7.62	0.8825
28	0.1638	7.36	0.491	189 23	12 37.5	290 59	19 23.9	0.5090	1.2776	7.67	0.8853
Mar. 1	0.1666	7.20	0.480	190 16	12 41.1	289 55	19 19.7	0.5006	1.2772	7.72	0.8879
2	0.1693	−7.07	−0.471	191 25	12 45.7	288 51	19 15.4	+0.4944	+1.2768	−7.76	−0.8903
3	0.1720	6.98	0.465	192 38	12 50.5	287 47	19 11.1	0.4904	1.2764	7.80	0.8926
4	0.1748	6.92	0.461	193 47	12 55.1	286 42	19 6.8	0.4889	1.2760	7.84	0.8947
5	0.1775	6.90	0.460	194 41	12 58.7	285 38	19 2.5	0.4893	1.2756	7.88	0.8967
6	0.1803	6.89	0.459	195 16	13 1.1	284 33	18 58.2	0.4900	1.2753	7.92	0.8986
(11^{h}.0) 7	0.1830	−6.89	−0.459	195 31	13 2.1	283 28	18 53.9	+0.4904	+1.2750	−7.95	−0.9003
8	0.1857	6.87	0.458	195 27	13 1.8	282 23	18 49.5	0.4893	1.2747	7.98	0.9019
9	0.1884	6.83	0.455	195 13	13 0.9	281 18	18 45.2	0.4859	1.2744	8.01	0.9033
10	0.1912	6.74	0.449	194 57	12 59.8	280 13	18 40.9	0.4800	1.2742	8.03	0.9046
11	0.1939	6 62	0.441	194 47	12 59.1	279 8	18 36.5	0.4712	1.2740	8.05	0.9058
12	0.1966	−6.46	−0.431	194 53	12 59.5	278 3	18 32.2	+0.4606	+1.2738	−8.07	−0.9069
13	0.2093	6.28	0.419	195 20	13 1.3	276 58	18 27.9	0.4491	1.2737	8.08	0.9078
14	0.2021	6.09	0.406	196 11	13 4.7	275 53	18 23.5	0.4379	1.2735	8.10	0.9086
15	0.2048	5.92	0.395	197 21	13 9.4	274 48	18 19.1	0.4281	1.2734	8.11	0.9092
16	0.2076	5.78	0.385	198 44	13 14.9	273 43	18 14.9	0.4210	1.2733	8.12	0.9097
17	0.2103	−5.68	−0.379	200 6	13 20.4	272 38	18 10.5	+0.4168	+1.2732	−8.13	−0.9101
18	0.2130	5.62	0.375	201 15	13 25.0	271 33	18 6.2	0.4154	1.2732	8.13	0.9103
19	0.2158	5.59	0.373	202 4	13 28.3	270 28	18 1.9	0.4154	1.2732	8.13	0.9104
20	0.2185	5.58	0.372	202 28	13 29.9	269 23	17 57.5	0.4157	1.2732	8.13	0.9104
21	0.2213	5.57	0.371	202 27	13 29.8	268 18	17 53.2	0.4149	1.2732	8.13	0.9103
(12^{h}.0) 22	0.2240	−5.55	−0.370	202 10	13 28.7	267 14	17 48.9	+0.4122	+1.2732	−8.13	−0.9101
23	0.2267	5.50	0.367	201 43	13 26.9	266 9	17 44.6	0.4068	1.2733	8.12	0.9097
24	0.2295	5.41	0.361	201 18	13 25.2	265 4	17 40.3	0.3983	1.2734	8.11	0.9092
25	0.2322	5.29	0.353	201 7	13 24.5	263 59	17 35.9	0.3877	1.2735	8.10	0.9086
26	0.2350	5.14	0.343	201 16	13 25.1	262 55	17 31.7	0.3759	1.2736	8.09	0.9078
27	0.2377	−4.98	−0.332	201 52	13 27.5	261 51	17 27.4	+0.3641	+1.2738	−8.07	−0.9069
28	0.2404	4.82	0.321	202 54	13 31.6	260 46	17 23.1	0.3530	1.2740	8.05	0.9058
29	0.2432	4.69	0.313	204 15	13 37.0	259 42	17 18.8	0.3449	1.2742	8.03	0.9046
30	0.2459	4.58	0.305	205 41	13 42.7	258 38	17 14.5	0.3404	1.2744	8.00	0.9033
31	0.2487	4.52	0.301	206 59	13 47.9	257 34	17 10.3	0.3391	1.2747	7.98	0.9018
Apr. 1	0.2514	−4.49	−0.299	207 58	13 51.9	256 30	17 6.0	+0.3396	+1.2750	−7.95	−0.9002
2	0.2541	−4.48	−0.299	208 28	13 53.9	255 25	17 1.7	+0.3410	+1.2753	−7.92	−0.8985

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	*f*		*G*		*H*		Log *g*.	Log *h*.	*i*	Log *i*.
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	″	s	° ′	h m	° ′	h m			″	
Apr. 1	0.2514	−4.49	−0.299	207 58	13 51.9	256 30	17 6.0	+0.3396	+1.2750	−7.95	−0.9002
2	0.2541	4.48	0.299	208 28	13 53.9	255 25	17 1.7	0.3410	1.2753	7.92	0.8985
3	0.2569	4.48	0.299	208 31	13 54.1	254 21	16 57.4	0.3412	1.2756	7.89	0.8967
4	0.2596	4.47	0.297	208 11	13 52.7	253 17	16 53.1	0.3388	1.2759	7.85	0.8947
5	0.2624	4.43	0.295	207 39	13 50.6	252 13	16 48.9	0.3330	1.2763	7.81	0.8926
$(13^{h}.0)$ 6	0.2651	−4.36	−0.291	207 5	13 48.3	251 9	16 44.6	+0.3232	+1.2767	−7.77	−0.8904
7	0.2678	4.24	0.283	206 41	13 46.7	250 6	16 40.4	0.3097	1.2771	7.73	0.8881
8	0.2706	4.08	0.272	206 40	13 46.7	249 3	16 36.2	0.2930	1.2775	7.68	0.8856
9	0.2733	3.89	0.259	207 14	13 48.9	248 0	16 32.0	0.2746	1.2779	7.63	0.8829
10	0.2761	3.70	0.247	208 22	13 53.5	246 58	16 27.9	0.2569	1.2784	7.58	0.8800
11	0.2788	−3.52	−0.235	210 2	14 0.1	245 56	16 23.7	+0.2411	+1.2789	−7.53	−0.8769
12	0.2815	3.35	0.223	212 2	14 8.1	244 54	16 19.6	0.2294	1.2794	7.48	0.8738
13	0.2843	3.22	0.215	214 3	14 16.2	243 52	16 15.5	0.2221	1.2799	7.42	0.8706
14	0.2870	3.14	0.209	215 46	14 23.1	242 50	16 11.3	0.2189	1.2804	7.36	0.8572
15	0.2898	3.08	0.205	216 54	14 27.6	241 49	16 7.3	0.2174	1.2809	7.30	0.8636
16	0.2925	−3.05	−0.203	217 25	14 29.7	240 48	16 3.2	+0.2158	+1.2814	−7.24	−0.8599
17	0.2952	3.03	0.202	217 21	14 29.4	239 47	15 59.1	0.2118	1.2819	7.17	0.8561
18	0.2980	2.99	0.199	216 53	14 27.5	238 46	15 55.1	0.2036	1.2825	7.10	0.8521
19	0.3007	2.93	0.195	216 14	14 24.9	237 45	15 51.0	0.1908	1.2831	7.03	0.8479
20	0.3035	2.83	0.189	215 41	14 22.7	236 44	15 46.9	0.1732	1.2837	6.96	0.8435
$(14^{h}.0)$ 21	0.3062	−2.70	−0.180	215 33	14 22.2	235 43	15 42.9	+0.1512	+1.2843	−6.89	−0.8389
22	0.3089	2.53	0.169	216 6	14 24.4	234 43	15 38.9	0.1262	1.2849	6.82	0.8342
23	0.3117	2.35	0.157	217 30	14 30.0	233 43	15 34.9	0.1011	1.2855	6.74	0.8293
24	0.3144	2.17	0.145	219 46	14 39.1	232 43	15 30.9	0.0787	1.2861	6.66	0.8242
25	0.3172	2.00	0.133	222 39	14 50.6	231 43	15 26.9	0.0621	1.2867	6.58	0.8190
26	0.3199	−1.86	−0.124	225 43	15 2.9	230 43	15 22.9	+0.0527	+1.2874	−6.50	−0.8136
27	0.3226	1.76	0.118	228 29	15 13.9	229 44	15 18.9	0.0496	1.2880	6.42	0.8080
28	0.3253	1.69	0.113	230 30	15 22.0	228 45	15 15.0	0.0501	1.2886	6.34	0.8022
29	0.3281	1.65	0.110	231 42	15 26.8	227 46	15 11.1	0.0503	1.2893	6.25	0.7962
30	0.3308	1.62	0.108	232 7	15 28.4	226 47	15 7.1	0.0468	1.2899	6.16	0.7899
May 1	0.3335	−1.59	−0.106	232 5	15 28.3	225 48	15 3.2	+0.0372	+1.2905	−6.07	−0.7834
2	0.3362	1.53	0.102	231 55	15 27.7	224 50	14 59.3	0.0193	1.2911	5.98	0.7767
3	0.3390	1.44	0.096	232 4	15 28.3	223 52	14 55.5	9.9927	1.2918	5.89	0.7698
4	0.3417	1.31	0.087	233 0	15 32.0	222 54	14 51.6	9.9581	1.2924	5.79	0.7627
5	0.3445	1.13	0.075	235 24	15 41.6	221 56	14 47.7	9.9171	1.2931	5.69	0.7553
6	0.3472	−0.92	−0.061	239 37	15 58.5	220 58	14 43.9	+9.8757	+1.2937	−5.59	−0.7477
$(15^{h}.0)$ 7	0.3499	0.70	0.047	245 58	16 23.9	220 0	14 40.0	9.8408	1.2943	5.49	0.7399
8	0.3527	0.47	0.031	253 47	16 55.1	219 3	14 36.2	9.8214	1.2950	5.39	0.7318
9	0.3554	0.27	0.018	261 42	17 26.8	218 6	14 32.4	9.8211	1.2956	5.29	0.7234
10	0.3582	−0.10	−0.007	268 17	17 53.1	217 9	14 28.6	9.8354	1.2962	5.19	0.7147
11	0.3609	+0.04	+0.003	273 7	18 12.5	216 12	14 24.8	+9.8550	+1.2968	−5.08	−0.7056
12	0.3636	0.14	0.009	276 19	18 25.3	215 16	14 21.1	9.8708	1.2974	4.97	0.6962
13	0.3664	0.21	0.013	278 37	18 34.5	214 20	14 17.3	9.8790	1.2980	4.86	0.6865
14	0.3691	0.27	0.018	280 39	18 42.6	213 24	14 13.6	9.8773	1.2986	4.75	0.6765
15	0.3719	0.34	0.023	283 15	18 53.0	212 28	14 9.9	9.8665	1.2992	4.64	0.6662
16	0.3746	+0.43	+0.029	287 1	19 8.1	211 32	14 6.1	+9.8496	+1.2997	−4.52	−0.6555
17	0.3773	+0.55	+0.037	292 24	19 29.6	210 36	14 2.4	+9.8326	+1.3003	−4.41	−0.6445

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f		G		H		Log g.	Log h.	i	Log i.
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	″	s	° ′	h m	° ′	h m			″	
May 17	0.3773	+0.55	+0.037	292 24	19 29.6	210 36	14 2.4	+9.8326	+1.3003	–4.41	–0.6445
18	0.3801	0.70	0.047	299 23	19 57.5	209 40	13 58.7	9.8241	1.3009	4.30	0.6330
19	0.3828	0.89	0.059	307 6	20 28.4	208 45	13 55.0	9.8321	1.3014	4.18	0.6210
20	0.3856	1.11	0.074	314 10	20 56.7	207 50	13 51.3	9.8583	1.3019	4.06	0.6085
21	0.3883	1.33	0.089	319 27	21 17.8	206 55	13 47.7	9.8960	1.3024	3.94	0.5956
(16$^{\rm h}$.0) 22	0.3910	+1.53	+0.102	322 46	21 31.1	206 0	13 44.0	+9.9371	+1.3029	–3.82	–0.5822
23	0.3938	1.72	0.115	324 25	21 37.7	205 5	13 40.3	9.9755	1.3034	3.70	0.5682
24	0.3965	1.87	0.125	325 0	21 40.0	204 10	13 36.7	0.0076	1.3039	3.58	0.5536
25	0.3993	1.98	0.132	325 3	21 40.2	203 16	13 33.1	0.0319	1.3043	3.46	0.5384
26	0.4020	2.06	0.137	325 4	21 40.3	202 22	13 29.5	0.0485	1.3047	3.33	0.5226
27	0.4047	+2.12	+0.141	325 30	21 42.0	201 28	13 25.9	+0.0590	+1.3051	–3.21	–0.5062
28	0.4075	2.18	0.145	326 36	21 46.4	200 34	13 22.3	0.0654	1.3055	3.09	0.4889
29	0.4102	2.26	0.151	328 34	21 54.3	199 40	13 18.7	0.0708	1.3059	2.96	0.4706
30	0.4130	2.37	0.158	331 21	22 5.4	198 46	13 15.1	0.0790	1.3063	2.83	0.4513
31	0.4157	2.52	0.169	334 34	22 18.3	197 53	13 11.5	0.0929	1.3067	2.70	0.4311
June 1	0.4184	+2.71	+0.181	337 46	22 31.1	196 59	13 7.9	+0.1137	+1.3071	–2.57	–0.4100
2	0.4212	2.94	0.196	340 28	22 41.9	196 6	13 4.4	0.1403	1.3075	2.44	0.3875
3	0.4239	3.19	0.213	342 20	22 49.3	195 12	13 0.8	0.1706	1.3078	2.31	0.3636
4	0.4267	3.45	0.230	343 19	22 53.3	194 19	12 57.3	0.2011	1.3081	2.18	0.3382
5	0.4294	3.69	0.246	343 35	22 54.3	193 26	12 53.7	0.2297	1 3084	2.05	0.3114
(17$^{\rm h}$.0) 6	0.4321	+3.90	+0.260	343 18	22 53.2	192 33	12 50.2	+0.2538	+1.3087	–1.92	–0.2826
7	0.4349	4.08	0.272	342 47	22 51.1	191 40	12 46.7	0.2739	1.3090	1 78	0.2515
8	0.4376	4.21	0.281	342 15	22 49.0	190 47	12 43.1	0.2893	1.3092	1.65	0.2179
9	0.4404	4.32	0.288	341 57	22 47.8	189 54	12 39.6	0.3007	1.3094	1.51	0.1813
10	0.4431	4 40	0.293	342 1	22 48.1	189 1	12 36.1	0.3091	1.3096	1.38	0.1412
11	0.4458	+4.49	+0.299	342 34	22 50.3	188 8	12 32.5	+0.3162	+1.3098	–1.25	–0.0970
12	0.4485	4.59	0.306	343 32	22 54.1	187 15	12 29.0	0.3238	1.3100	1.11	0.0476
13	0.4513	4.73	0.315	344 50	22 59.3	186 22	12 25.5	0.3331	1.3101	0.98	9.9917
14	0.4540	4.90	0.327	346 14	23 4.9	185 29	12 21.9	0.3454	1.3102	0.84	9.9273
15	0.4567	5.09	0.339	347 28	23 9.9	184 37	12 18.5	0.3605	1.3103	0.71	9.8514
16	0.4594	+5.32	+0.355	348 22	23 13.5	183 44	12 14.9	+0.3776	+1.3104	–0.58	–9.7592
17	0.4622	5.56	0.371	348 49	23 15.3	182 52	12 11.5	0.3959	1.3104	0.44	9.6412
18	0.4649	5.79	0.386	348 48	23 15.2	181 59	12 7.9	0.4135	1.3105	0.31	9.4770
19	0.4677	6.00	0.400	348 26	23 13.7	181 7	12 4.5	0.4295	1.3105	0.17	9.1988
20	0.4704	6.18	0.412	347 48	23 11.1	180 14	12 0.9	0.4429	1.3106	–0.04	–8.5647
(18$^{\rm h}$.0) 21	0.4731	+6.32	+0.421	347 7	23 8.4	179 22	11 57.5	+0.4538	+1.3106	+0.09	+8.8649
22	0.4759	6.42	0.428	346 29	23 5.9	178 29	11 53.9	0.4617	1.3106	0.23	9.3509
23	0.4786	6.50	0.433	346 6	23 4.4	177 37	11 50.5	0.4677	1.3105	0.36	9.5602
24	0.4814	6.57	0.438	346 1	23 4.1	176 44	11 46.9	0.4726	1.3105	0.50	9.6991
25	0.4841	6.65	0.443	346 17	23 5.1	175 52	11 43.5	0.4774	1.3104	0.64	9.8037
26	0.4868	+6.76	+0.451	346 52	23 7.5	174 59	11 39.9	+0.4831	+1.3103	+0.77	+9.8876
27	0.4896	6.90	0.460	347 36	23 10.4	174 7	11 36.5	0.4908	1.3102	0.91	9.9576
28	0.4923	7.09	0.473	348 23	23 13.5	173 14	11 32.9	0.5011	1.3101	1.04	0.0178
29	0.4951	7.31	0.487	349 2	23 16.1	172 22	11 29.5	0.5136	1.3099	1.18	0.0705
30	0.4978	7.56	0.504	349 26	23 17.7	171 29	11 25.9	0.5275	1.3097	1.31	0.1174
July 1	0.5005	+7.82	+0.521	349 30	23 18.0	170 36	11 22.4	+0.5417	+1.3095	+1.45	+0.1595
2	0.5033	+8.07	+0.538	349 17	23 17.1	169 44	11 18.9	+0.5557	+1.3093	+1.58	+0.1978

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day.* (Sid. Hour.)	τ	f		G		H		Log g.	Log h.	i	Log i.
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	″	s	° ′	h m	° ′	h m			″	
July 1	0.5005	+ 7.82	+0.521	349 30	23 18.0	170 36	11 22.4	+0.5417	+1.3095	+1.45	+0.1595
2	0.5033	8.07	0.538	349 17	23 17.1	169 44	11 18.9	0.5557	1.3093	1.58	0.1978
3	0.5060	8.30	0.553	348 49	23 15.3	168 51	11 15.4	0.5682	1.3091	1.71	0.2329
4	0.5088	8.49	0.566	348 12	23 12.8	167 58	11 11.9	0.5789	1.3089	1.84	0.2653
5	0.5115	8.64	0.576	347 37	23 10.5	167 5	11 8.3	0.5873	1.3086	1.97	0.2953
6	0.5142	+ 8.76	+0.584	347 8	23 8.5	166 12	11 4.8	+0.5940	+1.3083	+2.10	+0.3233
$(19^{h}.0)$ 7	0.5170	8.84	0.589	346 48	23 7.2	165 19	11 1.3	0.5987	1.3080	2.23	0.3494
8	0.5197	8.92	0.595	346 44	23 6.9	164 26	10 57.7	0.6028	1.3077	2.36	0.3739
9	0.5225	9.02	0.601	346 55	23 7.7	163 33	10 54.2	0.6070	1.3074	2.49	0.3971
10	0.5252	9.14	0.609	347 17	23 9.1	162 39	10 50.6	0.6120	1.3070	2.62	0.4189
11	0.5279	+ 9.28	+0.619	347 45	23 11.0	161 45	10 47.0	+0.6181	+1.3066	+2.75	+0.4396
12	0.5307	9.47	0.631	348 13	23 12.9	160 52	10 43.5	0.6258	1.3062	2.88	0.4592
13	0.5334	9.68	0.645	348 33	23 14.2	159 59	10 39.9	0.6349	1.3058	3.01	0.4779
14	0.5362	9.90	0.660	348 40	23 14.7	159 5	10 36.3	0.6448	1.3054	3.14	0.4957
15	0.5389	10.13	0.675	348 32	23 14.1	158 11	10 32.7	0.6547	1.3050	3.26	0.5126
16	0.5416	+10.33	+0.689	348 12	23 12.8	157 17	10 29.1	+0.6639	+1.3046	+3.39	+0.5287
17	0.5444	10.51	0.701	347 41	23 10.7	156 23	10 25.5	0.6720	1.3042	3.51	0.5442
18	0.5471	10.65	0.710	347 6	23 8.4	155 29	10 21.9	0.6786	1.3037	3.63	0.5591
19	0.5499	10.74	0.716	346 31	23 6.1	154 34	10 18.3	0.6834	1.3032	3.75	0.5734
20	0.5526	10.81	0.721	346 3	23 4.2	153 39	10 14.6	0.6871	1.3027	3.87	0.5871
21	0.5553	+10.86	+0.724	345 46	23 3.1	152 45	10 11.0	+0.6897	+1.3022	+3.99	+0.6001
$(20^{h}.0)$ 22	0.5581	10.92	0.728	345 40	23 2.7	151 50	10 7.3	0.6922	1.3017	4.11	0.6127
23	0.5608	11.00	0.733	345 47	23 3.1	150 55	10 3.7	0.6950	1.3012	4.23	0.6249
24	0.5636	11.11	0.741	346 3	23 4.2	150 0	10 0.0	0.6988	1.3006	4.34	0.6367
25	0.5663	11.27	0.751	346 24	23 5.6	149 5	9 56.3	0.7042	1.3000	4.45	0.6481
26	0.5690	+11.45	+0.763	346 44	23 6.9	148 10	9 52.7	+0.7109	+1.2995	+4.56	+0.6591
27	0.5718	11.67	0.778	346 57	23 7.8	147 15	9 49.0	0.7187	1.2990	4.67	0.6697
28	0.5745	11.91	0.794	346 59	23 7.9	146 20	9 45.3	0.7271	1.2984	4.78	0.6799
29	0.5773	12.13	0.809	346 50	23 7.3	145 24	9 41.6	0.7357	1.2978	4.89	0.6897
30	0.5800	12.35	0.823	346 30	23 6.0	144 28	9 37.9	0.7437	1.2972	5.00	0.6990
31	0.5827	+12.52	+0.835	346 3	23 4.2	143 32	9 34.1	+0.7506	+1.2966	+5.11	+0.7080
Aug. 1	0.5854	12.66	0.844	345 32	23 2.1	142 36	9 30.4	0.7562	1.2960	5.22	0.7168
2	0.5882	12.75	0.850	345 4	23 0.3	141 40	9 26.7	0.7604	1.2954	5.32	0.7254
3	0.5909	12.82	0.855	344 42	22 58.8	140 43	9 22.9	0.7636	1.2948	5.42	0.7338
4	0.5936	12.87	0.858	344 29	22 57.9	139 46	9 19.1	0.7658	1.2942	5.52	0.7419
5	0.5963	+12.93	+0.862	344 28	22 57.9	138 49	9 15.3	+0.7679	+1.2936	+5.62	+0.7496
$(21^{h}.0)$ 6	0.5991	13.01	0.867	344 36	22 58.4	137 52	9 11.5	0.7702	1.2929	5.72	0.7571
7	0.6018	13.12	0.875	344 50	22 59.3	136 55	9 7.7	0.7733	1.2923	5.82	0.7643
8	0.6046	13.26	0.884	345 6	23 0.4	135 57	9 3.8	0.7774	1.2916	5.91	0.7713
9	0.6073	13.44	0.896	345 20	23 1.3	134 59	8 59.9	0.7827	1.2910	6.00	0.7781
10	0.6100	+13.63	+0.909	345 26	23 1.7	134 1	8 56.1	+0.7887	+1.2904	+6.09	+0.7846
11	0.6128	13.83	0.922	345 22	23 1.5	133 3	8 52.2	0.7949	1.2897	6.18	0.7909
12	0.6155	14.01	0.934	345 9	23 0.6	132 5	8 48.3	0.8010	1.2891	6.27	0.7970
13	0.6183	14.17	0.945	344 47	22 59.1	131 6	8 44.4	0.8065	1.2885	6.36	0.8030
14	0.6210	14.28	0.952	344 21	22 57.4	130 7	8 40.5	0.8110	1.2879	6.44	0.8088
15	0.6237	+14.36	+0.957	343 53	22 55.5	129 8	8 36.5	+0.8143	+1.2872	+6.52	+0.8143
16	0.6265	+14.40	+0.960	343 28	22 53.9	128 9	8 32.6	+0.8164	+1.2866	+6.60	+0.8196

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		τ	f		G		H		Log g.	Log h.	i	Log i.
			In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	″	s	° ′	h m	° ′	h m			″	
Aug.	16	0.6265	+14.40	+0.960	343 28	22 53.9	128 9	8 32.6	+0.8164	+1.2866	+6.60	+0.8196
	17	0.6292	14.42	0.961	343 10	22 52.7	127 10	8 28.7	0.8178	1.2860	6.68	0.8248
	18	0.6320	14.44	0.963	343 1	22 52.1	126 10	8 24.7	0.8188	1.2854	6.76	0.8298
	19	0.6347	14.48	0.965	343 2	22 52.1	125 11	8 20.7	0.8198	1.2848	6.84	0.8346
	20	0.6374	14.54	0.969	343 11	22 52.7	124 11	8 16.7	0.8214	1.2842	6.91	0.8392
($22^h.0$)	21	0.6402	+14.65	+0.977	343 26	22 53.7	123 11	8 12.7	+0.8239	+1.2836	+6.98	+0.8437
	22	0.6429	14.79	0.986	343 41	22 54.7	122 11	8 8.7	0.8276	1.2831	7.05	0.8480
	23	0.6457	14.97	0.998	343 53	22 55.5	121 11	8 4.7	0.8323	1.2825	7.12	0.8522
	24	0.6484	15.17	1.011	343 58	22 55.9	120 11	8 0.7	0.8378	1.2820	7.18	0.8562
	25	0.6511	15.36	1.024	343 55	22 55.7	119 10	7 56.7	0.8436	1.2814	7.24	0.8600
	26	0.6539	+15.55	+1.037	343 44	22 54.9	118 9	7 52.6	+0.8491	+1.2809	+7.30	+0.8636
	27	0.6566	15.71	1.047	343 26	22 53.7	117 8	7 48.5	0.8542	1.2804	7.36	0.8671
	28	0.6594	15.82	1.055	343 4	22 52.3	116 7	7 44.4	0.8582	1.2799	7.42	0.8705
	29	0.6621	15.89	1.059	342 42	22 50.8	115 5	7 40.3	0.8611	1.2794	7.48	0.8738
	30	0.6648	15.94	1.063	342 24	22 49.6	114 4	7 36.3	0.8630	1.2789	7.53	0.8770
	31	0.6676	+15.97	+1.065	342 13	22 48.9	113 2	7 32.1	+0.8642	+1.2784	+7.58	+0.8800
Sept.	1	0.6703	15.99	1.066	342 11	22 48.7	112 0	7 28.0	0.8649	1.2780	7.63	0.8828
	2	0.6731	16.03	1.069	342 17	22 49.1	110 58	7 23.9	0.8658	1.2776	7.68	0.8854
	3	0.6758	16.10	1.073	342 29	22 49.9	109 56	7 19.7	0.8672	1.2772	7.72	0.8878
	4	0.6785	16.21	1.081	342 45	22 51.0	108 54	7 15.6	0.8694	1.2768	7.76	0.8901
($23^h.0$)	5	0.6813	+16.35	+1.090	343 0	22 52.0	107 52	7 11.5	+0.8724	+1.2764	+7.80	+0.8923
	6	0.6840	16.50	1.100	343 10	22 52.7	106 49	7 7.3	0.8762	1.2760	7.84	0.8944
	7	0.6868	16.67	1.111	343 14	22 52.9	105 46	7 3.1	0.8805	1.2757	7.88	0.8964
	8	0.6895	16.84	1.123	343 10	22 52.7	104 43	6 58.9	0.8848	1.2754	7.91	0.8983
	9	0.6922	16 97	1.132	342 58	22 51.9	103 40	6 54.7	0.8888	1.2751	7.94	0.9001
	10	0.6950	+17.08	+1.139	342 42	22 50.8	102 37	6 50.5	+0.8921	+1.2748	+7.97	+0.9017
	11	0.6977	17.14	1.143	342 22	22 49.5	101 34	6 46.3	0.8945	1.2746	8.00	0.9032
	12	0.7005	17.17	1.145	342 4	22 48.3	100 31	6 42.1	0.8959	1.2743	8.02	0.9045
	13	0.7032	17.18	1.145	341 50	22 47.3	99 27	6 37.8	0.8965	1.2741	8.04	0.9056
	14	0.7059	17.18	1.145	341 44	22 46.9	98 24	6 33.6	0.8968	1.2739	8.06	0.9066
	15	0.7086	+17.18	+1.145	341 46	22 47.1	97 20	6 29.3	+0.8968	+1.2737	+8.08	+0.9075
	16	0.7114	17.21	1.147	341 56	22 47.7	96 16	6 25.1	0.8973	1.2736	8.10	0.9083
	17	0.7141	17.28	1.152	342 12	22 48.8	95 12	6 20.8	0.8983	1.2734	8.11	0.9090
	18	0.7168	17.39	1.159	342 30	22 50.0	94 8	6 16.5	0.9003	1.2733	8.12	0.9096
	19	0.7195	17.54	1.169	342 47	22 51.1	93 4	6 12.3	0.9035	1.2733	8.12	0.9101
($0^h.0$)	20	0.7223	+17.71	+1.181	342 59	22 51.9	92 0	6 8.0	+0.9072	+1.2733	+8.12	+0.9104
	21	0.7250	17.90	1.193	343 4	22 52.3	90 56	6 3.7	0.9115	1.2732	8.13	0.9106
	22	0.7278	18.07	1.205	343 2	22 52.1	89 52	5 59.5	0.9158	1.2732	8.13	0.9106
	23	0.7305	18.22	1.215	342 54	22 51.6	88 48	5 55.2	0.9197	1.2732	8.13	0.9105
	24	0.7332	18.34	1.223	342 41	22 50.7	87 44	5 50.9	0.9229	1.2733	8.12	0.9103
	25	0.7360	+18.41	+1.227	342 28	22 49.9	86 40	5 46.7	+0.9253	+1.2734	+8.12	+0.9100
	26	0.7387	18.45	1.230	342 17	22 49.1	85 36	5 42.4	0.9267	1.2734	8.11	0.9095
	27	0.7415	18.47	1.231	342 11	22 48.7	84 32	5 38.1	0.9274	1.2735	8.10	0.9089
	28	0.7442	18.49	1.233	342 12	22 48.8	83 27	5 33.8	0.9278	1.2736	8.09	0.9081
	29	0.7469	18.52	1.235	342 21	22 49.4	82 23	5 29.5	0.9280	1.2738	8.07	0.9072
	30	0.7497	+18.57	+1.238	342 36	22 50.4	81 19	5 25.3	+0.9287	+1.2740	+8.05	+0.9062
Oct.	1	0.7524	+18.67	+1.245	342 55	22 51.7	80 15	5 21.0	+0.9301	+1.2742	+8.03	+0.9051

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f		G		H		Log g.	Log h.	i	Log i.
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	″	s	° ′	h m	° ′	h m			″	
Oct. 1	0.7524	+18.67	+1.245	342 55	22 51.7	80 15	5 21.0	+0.9301	+1.2742	+8.03	+0.9051
2	0.7552	18.79	1.253	343 15	22 53.0	79 11	5 16.7	0.9322	1.2744	8.01	0.9039
3	0.7579	18.93	1.262	343 32	22 54.1	78 7	5 12.5	0.9349	1.2746	7.99	0.9026
4	0.7606	19.10	1.273	343 44	22 54.9	77 3	5 8.2	0.9383	1.2749	7.96	0.9011
5	0.7634	19.27	1.285	343 48	22 55.2	75 59	5 3.9	0.9420	1.2752	7.93	0.8995
$(1^{h}.0)$ 6	0.7661	+19.41	+1.294	343 46	22 55.1	74 55	4 59.7	+0.9454	+1.2755	+7.90	+0.8977
7	0.7689	19.52	1.301	343 38	22 54.6	73 51	4 55.4	0.9483	1.2758	7.87	0.8957
8	0.7716	19.60	1.307	343 28	22 53.9	72 47	4 51.1	0.9503	1.2762	7.83	0.8936
9	0.7743	19.65	1.310	343 17	22 53.1	71 43	4 46.9	0.9517	1.2766	7.79	0.8916
10	0.7771	19.66	1.311	343 10	22 52.7	70 39	4 42.6	0.9523	1.2770	7.75	0.8893
11	0.7798	+19.67	+1.312	343 9	22 52.6	69 35	4 38.3	+0.9525	+1.2774	+7.71	+0.8868
12	0.7826	19.68	1.312	343 15	22 53.0	68 32	4 34.1	0.9524	1.2778	7.66	0.8841
13	0.7853	19.70	1.313	343 29	22 53.9	67 29	4 29.9	0.9525	1.2782	7.61	0.8812
14	0.7880	19.77	1.318	343 47	22 55.1	66 25	4 25.6	0.9532	1.2787	7.56	0.8782
15	0.7908	19.89	1.326	344 9	22 56.6	65 22	4 21.5	0.9549	1.2792	7.51	0.8751
16	0.7935	+20.03	+1.335	344 30	22 58.0	64 19	4 17.3	+0.9575	+1.2797	+7.45	+0.8719
17	0.7963	20.21	1.347	344 48	22 59.2	63 16	4 13.1	0.9608	1.2802	7.39	0.8685
18	0.7990	20.41	1.361	345 1	23 0.1	62 13	4 8.9	0.9645	1.2807	7.33	0.8650
19	0.8017	20.60	1.373	345 6	23 0.4	61 10	4 4.7	0.9686	1.2812	7.27	0.8613
20	0.8045	20.78	1.385	345 5	23 0.3	60 7	4 0.5	0.9723	1.2817	7.20	0.8574
$(2^{h}.0)$ 21	0.8072	+20.93	+1.395	345 0	23 0.0	59 5	3 56.3	+0.9755	+1.2823	+7.13	+0.8533
22	0.8100	21.04	1.403	344 54	22 59.6	58 3	3 52.2	0.9780	1.2829	7.06	0.8491
23	0.8127	21.11	1.407	344 49	22 59.3	57 1	3 48.1	0.9796	1.2835	6.99	0.8447
24	0.8154	21.16	1.411	344 47	22 59.1	55 59	3 43.9	0.9807	1.2841	6.92	0.8401
25	0.8182	21.20	1.413	344 52	22 59.5	54 57	3 39.8	0.9814	1.2847	6.84	0.8353
26	0.8209	+21.25	+1.417	345 3	23 0.2	53 55	3 35.7	+0.9820	+1.2853	+6.76	+0.8303
27	0.8237	21.32	1.421	345 20	23 1.3	52 53	3 31.5	0.9828	1.2859	6.68	0.8251
28	0.8264	21.42	1.428	345 41	23 2.7	51 52	3 27.5	0.9841	1.2866	6.60	0.8198
29	0.8291	21.56	1.437	346 3	23 4.2	50 50	3 23.3	0.9862	1.2872	6.52	0.8142
30	0.8319	21.73	1.449	346 24	23 5.6	49 49	3 19.3	0.9891	1.2879	6.43	0.8084
31	0.8346	+21.93	+1.462	346 40	23 6.7	48 48	3 15.2	+0.9925	+1.2885	+6.34	+0.8024
Nov. 1	0.8374	22.13	1.475	346 49	23 7.3	47 47	3 11.1	0.9960	1.2892	6.25	0.7962
2	0.8401	22.31	1.487	346 53	23 7.5	46 46	3 7.1	0.9996	1.2899	6.16	0.7899
3	0.8428	22.47	1.498	346 51	23 7.4	45 46	3 3.1	1.0028	1.2906	6.07	0.7832
4	0.8455	22.60	1.507	346 45	23 7.0	44 45	2 59.0	1.0053	1.2912	5.98	0.7762
$(3^{h}.0)$ 5	0.8483	+22.69	+1.513	346 39	23 6.6	43 45	2 55.0	+1.0072	+1.2919	+5.88	+0.7690
6	0.8510	22.74	1.516	346 36	23 6.4	42 45	2 51.0	1.0084	1.2925	5.78	0.7616
7	0.8537	22.78	1.519	346 36	23 6.4	41 45	2 47.0	1.0091	1.2932	5.68	0.7540
8	0.8564	22.82	1.521	346 43	23 6.9	40 45	2 43.0	1.0096	1.2938	5.58	0.7460
9	0.8592	22.88	1.525	346 56	23 7.7	39 46	2 39.1	1.0103	1.2945	5.47	0.7377
10	0.8619	+22.96	+1.531	347 14	23 8.9	38 46	2 35.1	+1.0115	+1.2951	+5.36	+0.7291
11	0.8647	23.10	1.540	347 35	23 10.3	37 47	2 31.1	1.0134	1.2958	5.25	0.7202
12	0.8674	23.27	1.551	347 56	23 11.7	36 47	2 27.1	1.0160	1.2964	5.14	0.7111
13	0.8701	23.48	1.565	348 14	23 12.9	35 48	2 23.2	1.0194	1.2971	5.03	0.7015
14	0.8729	23.71	1.581	348 28	23 13.9	34 49	2 19.3	1.0234	1.2977	4.92	0.6915
15	0.8756	+23.95	+1.597	348 35	23 14.3	33 50	2 15.3	+1.0275	+1.2983	+4.80	+0.6812
16	0.8784	+24.18	+1.612	348 36	23 14.4	32 51	2 11.4	+1.0315	+1.2989	+4.69	+0.6706

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ			G		H		Log g.	Log h.	i	Log i.
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	″	s	° ′	h m	° ′	h m			″	
Nov. 16	0.8784	+24.18	+1.612	348 36	23 14.4	32 51	2 11.4	+1.0315	+1.2989	+4.69	+0.6706
17	0.8811	24.38	1.625	348 33	23 14.2	31 53	2 7.5	1.0350	1.2995	4.57	0.6596
18	0.8838	24.54	1.636	348 28	23 13.9	30 54	2 3.6	1.0380	1.3001	4.45	0.6481
19	0.8866	24.65	1.643	348 23	23 13.5	29 56	1 59.7	1.0402	1.3006	4.33	0.6361
($4^{h}.0$) 20	0.8893	24.75	1.650	348 21	23 13.4	28 58	1 55.9	1.0419	1.3012	4.21	0.6236
21	0.8921	+24.83	+1.655	348 24	23 13.6	28 0	1 52.0	+1.0432	+1.3017	+4.09	+0.6107
22	0.8948	24.92	1.661	348 33	23 14.2	27 2	1 48.1	1.0445	1.3023	3.96	0.5973
23	0.8975	25.01	1.667	348 46	23 15.1	26 4	1 44.3	1.0459	1.3028	3.83	0.5833
24	0.9003	25.15	1.677	349 3	23 16.2	25 6	1 40.4	1.0477	1.3033	3.70	0.5686
25	0.9030	25.31	1.687	349 22	23 17.5	24 8	1 36.5	1.0501	1.3038	3.57	0.5532
26	0.9058	+25.52	+1.701	349 39	23 18.6	23 11	1 32.7	+1.0532	+1.3043	+3.44	+0.5371
27	0.9085	25.74	1.716	349 53	23 19.5	22 14	1 28.9	1.0567	1.3048	3.31	0.5202
28	0.9112	25.98	1.732	350 1	23 20.1	21 17	1 25.1	1.0605	1.3053	3.18	0.5025
29	0.9140	26.21	1.747	350 4	23 20.3	20 20	1 21.3	1.0643	1.3057	3.04	0.4839
30	0.9167	26.41	1.761	350 1	23 20.1	19 23	1 17.5	1.0677	1.3061	2.91	0.4643
Dec. 1	0.9195	+26.59	+1.773	349 55	23 19.7	18 26	1 13.7	+1.0708	+1.3065	+2.77	+0.4437
2	0.9222	26.73	1.782	349 48	23 19.2	17 29	1 9.9	1.0731	1.3069	2.64	0.4221
3	0.9249	26.82	1.788	349 42	23 18.8	16 32	1 6.1	1.0749	1.3073	2.51	0.3991
4	0.9277	26.91	1.794	349 39	23 18.6	15 35	1 2.3	1.0761	1.3076	2.37	0.3745
($5^{h}.0$) 5	0.9304	26.98	1.799	349 41	23 18.7	14 39	0 58.6	1.0773	1.3080	2.23	0.3482
6	0.9332	+27.05	+1.803	349 49	23 19.3	13 43	0 54.9	+1.0784	+1.3083	+2.09	+0.3202
7	0.9359	27.16	1.811	350 1	23 20.1	12 46	0 51.1	1.0798	1.3086	1.95	0.2902
8	0.9386	27.31	1.821	350 15	23 21.0	11 49	0 47.3	1.0819	1.3089	1.81	0.2578
9	0.9414	27.50	1.833	350 30	23 22.0	10 53	0 43.5	1.0846	1.3091	1.67	0.2225
10	0.9441	27.73	1.849	350 43	23 22.9	9 57	0 39.8	1.0880	1.3094	1.53	0.1839
11	0.9469	+27.99	+1.866	350 52	23 23.5	9 1	0 36.1	+1.0917	+1.3096	+1.39	+0.1415
12	0.9496	28.26	1.884	350 55	23 23.7	8 5	0 32.3	1.0958	1.3098	1.24	0.0943
13	0.9523	28.51	1.901	350 54	23 23.6	7 8	0 28.5	1.0997	1.3099	1.10	0.0410
14	0.9551	28.74	1.916	350 48	23 23.2	6 12	0 24.8	1.1033	1.3101	0.96	9.9800
15	0.9578	28.94	1.929	350 40	23 22.7	5 16	0 21.1	1.1065	1.3102	0.81	9.9090
16	0.9606	+29.10	+1.940	350 32	23 22.1	4 20	0 17.3	+1.1091	+1.3103	+0.67	+9.8237
17	0.9633	29.22	1.948	350 26	23 21.7	3 24	0 13.6	1.1110	1.3104	0.52	9.7169
18	0.9660	29.33	1.955	350 23	23 21.5	2 28	0 9.9	1.1126	1.3104	0.38	9.5736
19	0.9687	29.43	1.962	350 25	23 21.7	1 32	0 6.1	1.1141	1.3105	0.23	9.3528
($6^{h}.0$) 20	0.9715	29.54	1.969	350 31	23 22.1	0 36	0 2.5	1.1156	1.3105	+0.09	+8.9666
21	0.9742	+29.68	+1.979	350 41	23 22.7	359 40	23 58.7	+1.1175	+1.3106	−0.05	−8.7185
22	0.9769	29.85	1.990	350 52	23 23.5	358 44	23 54.9	1.1197	1.3106	0.19	9.2655
23	0.9796	30.07	2.005	351 3	23 24.2	357 48	23 51.2	1.1226	1.3105	0.33	9.5241
24	0.9824	30.31	2.021	351 11	23 24.7	356 52	23 47.5	1.1259	1.3104	0.48	9.6821
25	0.9851	30.55	2.037	351 15	23 25.0	355 56	23 43.7	1.1293	1.3103	0.63	9.7970
26	0.9879	+30.80	+2.053	351 14	23 24.9	355 0	23 40.0	+1.1328	+1.3102	−0.77	−9.8873
27	0.9906	31.03	2.069	351 8	23 24.5	354 3	23 36.2	1.1361	1.3101	0.92	9.9619
28	0.9933	31.22	2.081	350 59	23 23.9	353 7	23 32.5	1.1390	1.3100	1.06	0.0253
29	0.9961	31.39	2.093	350 49	23 23.3	352 11	23 28.7	1.1414	1.3098	1.21	0.0806
30	0.9988	31.50	2.100	350 39	23 22.6	351 14	23 24.9	1.1433	1.3096	1.35	0.1294
31	1.0016	+31.59	+2.106	350 31	23 22.1	350 18	23 21.2	+1.1447	+1.3094	−1.49	−0.1732
32	1.0043	+31.67	+2.111	350 27	23 21.8	349 21	23 17.4	+1.1458	+1.3092	−1.63	−0.2128

MEAN PLACES FOR 1890.0. (January 0^d.0–0^d.320, Washington.)

Name of Star.		Magni-tude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
			h	m	s	s	°	′	″	″
α Andromedæ . .		2.1	0	2	42.116	+ 3.0915	+ 28	28	59.08	+ 19.885
* β Cassiopeæ . .		2.4	0	3	18.596	3.1744	+ 58	32	33.81	19.852
* 22 Andromedæ . .		4.9	0	4	36.279	3.1024	+ 45	27	35.69	20.035
4 Draconis (H.) .	S. P.	5.1	0	7	2.791	2.8853	+101	46	21.02	20.022
γ Pegasi (*Algenib*) .		2.8	0	7	34.288	3.0837	+ 14	34	19.05	20.023
* σ Andromedæ . .		4.4	0	12	34.919	+ 3.1231	+ 36	10	30.94	+ 19.983
* ι Ceti . . .		3.6	0	13	49.228	3.0528	− 9	26	2.51	19.957
* 6 Ursæ Minoris .	S. P.	6.2	0	14	20.390	0.1610	+ 91	41	24.57	19.940
* 44 Piscium . . .		5.8	0	19	45.810	3.0732	+ 1	19	49.63	19.952
β Hydri . . .		2.8	0	19	57.546	3.2304	− 77	52	25.80	20.284
12 Ceti . . .		6.0	0	24	25.488	+ 3.0611	− 4	33	54.47	+ 19.938
κ Draconis . .	S. P	3.8	0	28	47.225	2.5916	+109	36	19.56	19.889
* π Andromedæ . .		4.4	0	31	0.336	3.1907	+ 33	6	49.15	19.871
α Cassiopeæ (*var.*) .		2.3	0	34	16.050	3.3741	+ 55	56	2.03	19.788
β Ceti . . .		2.2	0	38	4.092	3.0142	− 18	35	26.12	19.801
21 Cassiopeæ . .		5.7	0	38	23.220	+ 3.8585	+ 74	23	12.07	+ 19.752
* ο Cassiopeæ . .		4.7	0	38	35.745	3.3194	+ 47	40	55.75	19.755
* δ Piscium . . .		4.8	0	42	58.489	3.1074	+ 6	59	10.47	19.649
32^2 Camelop. (H.).	S. P.	5.2	0	48	19.458	0.3939	+ 95	59	21.24	19.596
* γ Cassiopeæ . .		2.3	0	50	4.280	3.5794	+ 60	7	14.96	19.563
* μ Andromedæ . .		4.0	0	50	38.855	+ 3.3113	+ 37	54	9.49	+ 19.617
* 43 Cephei (H.) . .		4.6	0	53	48.198	7.2427	+ 85	40	0.00	19.502
ε Piscium . . .		4.3	0	57	14.039	3.1091	+ 7	17	51.88	19.454
β Andromedæ . .		2.2	1	3	34.426	3.3444	+ 35	2	13.72	19.164
* κ Tucanæ . . .		4.9	1	12	2.410	2.0551	− 69	27	37.15	19.170
* *f* Piscium . . .		5.1	1	12	7.462	+ 3.0897	+ 3	2	5.74	+ 19.033
α Ursæ Minoris (*Polaris*)		2.2	1	18	31.136	23.3310	+ 88	43	18.40	18.887
θ^1 Ceti . . .		3.6	1	18	31.489	2.9971	− 8	45	4.15	18.667
38 Cassiopeæ . .		5.9	1	23	2.928	4.3786	+ 69	41	53.28	18.675
* κ Octantis . .	S. P.	5.4	1	23	15.630	8.7534	− 94	46	42.32	18.776
η Piscium . . .		3.7	1	25	35.824	+ 3.2026	+ 14	46	42.79	+ 18.663
* υ Andromedæ . .		4.2	1	30	20.525	3.5045	+ 40	51	18.57	18.145
* π Piscium . . .		5.5	1	31	16.005	3.1705	+ 11	34	43.37	18.526
α Eridani (*Achernar*) .		0.4	1	33	36.695	2.2323	− 57	47	44.81	18.356
* ν Piscium . . .		4.6	1	35	42.411	3.1179	+ 4	55	50.61	18.329
ο Piscium . . .		4.4	1	39	35.095	+ 3.1623	+ 8	36	13.28	+ 18.216
* ζ Ceti . . .		3.6	1	46	1.847	2.9618	− 10	52	46.95	17.823
β Arietis . . .		2.8	1	48	33.789	3.3036	+ 20	16	12.10	17.727
50 Cassiopeæ . .		4.1	1	54	2.842	5.0122	+ 71	53	18.90	17.644
* γ Andromedæ . .		2.2	1	57	8.848	3.6606	+ 41	48	5.41	17.441
α Arietis . . .		2.1	2	0	58.347	+ 3.3711	+ 22	56	31.04	+ 17.172
α Draconis . .	S. P.	3.7	2	1	24.730	1.6238	+115	5	54.29	17.299
* β Trianguli . .		3.1	2	2	59.930	3.5547	+ 34	27	59.85	17.203
ξ^1 Ceti . . .		4.5	2	7	10.187	+ 3.1741	+ 8	19	49.26	17.029
* 4 Ursæ Minoris .	S. P.	4.9	2	9	17.022	− 0.3219	+101	56	7.95	16.907
* γ Trianguli . .		4.3	2	10	46.507	+ 3.5511	+ 33	20	17.20	+ 16.844
* 67 Ceti . . .		5.6	2	11	29.769	2.9894	− 6	55	46.16	16.732
* δ Hydri . . .		4.2	2	19	47.615	1.0549	− 69	9	35.95	16.450
ι Cassiopeæ . .		4.6	2	20	0.151	4.8630	+ 66	54	26.20	16.431
ξ^2 Ceti . . .		4.5	2	22	18.638	+ 3.1838	+ 7	57	59.74	+ 16.294

* Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

MEAN PLACES FOR 1890.0. (January $0^d.0-0^d.320$, Washington.)

Name of Star.		Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
			h	m	s	s	°	′	″	″
5 Ursæ Minoris	S. P.	4.5	2	27	45.799	− 0.1896	+103	48	54.15	+ 16.012
* δ Ceti		4.1	2	33	50.669	+ 3.0728	− 0	8	47.64	15.696
* μ Hydri		5.3	2	34	0.541	− 1.4339	− 79	35	20.24	15.682
* θ Persei		4.2	2	36	41.268	+ 4.0700	+ 48	45	45.43	15.456
γ Ceti		3.6	2	37	36.026	3.1033	+ 2	46	18.56	15.338
* σ Arietis		5.5	2	45	25.160	+ 3.3046	+ 14	37	41.78	+ 15.007
β Ursæ Minoris	S. P.	2.2	2	51	1.826	− 0.2304	+105	23	41.95	14.719
* 47 Cephei (H.)		5.7	2	51	28.829	+ 7.7244	+ 78	58	58.19	14.692
* ε Arietis		4.6	2	52	55.328	3.4211	+ 20	53	59.93	14.604
α Ceti		2.6	2	56	31.739	3.1304	+ 3	39	27.85	14.307
* β Persei (*Algol*) (*var.*)		2.3	3	1	0.694	+ 3.8838	+ 40	31	52.32	+ 14.119
48 Cephei (H.)		5.5	3	6	22.699	7.4089	+ 77	19	45.98	13.727
ζ Arietis		4.8	3	8	34.714	3.4394	+ 20	38	10.60	13.555
α Persei		1.9	3	16	28.260	4.2578	+ 49	28	8.33	13.091
* ρ Octantis	S. P.	5.7	3	18	0.874	+12.9858	− 95	54	12.91	12.978
* ι Hydri		5.7	3	18	42.669	− 1.5973	− 77	47	23.42	+ 13.027
γ^2 Ursæ Minoris	S. P.	3.2	3	20	54.411	− 0.1332	+107	46	28.54	12.811
* *f* Tauri		4.3	3	24	47.965	+ 3.3050	+ 12	33	33.22	12.562
ε Eridani		3.7	3	27	44.860	2.8237	− 9	49	51.00	12.392
δ Persei		3.1	3	35	5.651	4.2502	+ 47	26	6.17	11.808
* γ Camelopardalis (H.)		4.6	3	38	45.121	+ 6.2393	+ 70	59	32.02	+ 11.541
η Tauri		3.1	3	40	56.710	3.5570	+ 23	45	51.67	11.379
ζ Persei		3.0	3	47	13.054	+ 3.7603	+ 31	33	22.29	10.948
ζ Ursæ Minoris	S. P.	4.6	3	47	59.941	− 2.2503	+101	52	2.77	10.923
* γ Hydri		3.3	3	48	56.755	− 0.9961	− 74	34	33.24	10.982
* ε Persei		3.0	3	50	28.291	+ 4.0101	+ 39	41	28.55	+ 10.720
γ Eridani		3.0	3	52	53.870	2.7986	− 13	49	18.95	10.444
* A^1 Tauri		4.6	3	58	11.537	3.5400	+ 21	46	49.83	10.081
* *c* Persei		4.3	4	0	40.569	4.3373	+ 47	25	4.75	9.938
Groombr. 2320	S. P.	5.5	4	6	1.183	0.1400	+111	53	59.86	9.498
* o^1 Eridani		4.2	4	6	29.751	+ 2.9268	− 7	7	30.00	+ 9.615
γ Tauri		3.8	4	13	32.009	+ 3.4090	+ 15	21	41.08	8.957
* η Ursæ Minoris	S. P.	5.0	4	20	43.473	− 1.8158	+103	59	29.03	8.163
ε Tauri		3.6	4	22	11.588	+ 3.4975	+ 18	56	8.81	8.256
η Draconis	S. P.	2.0	4	22	30.255	+ 0.8064	+118	14	12.33	8.221
* δ Mensæ		5.6	4	25	25.929	− 4.2223	− 80	28	17.26	+ 8.047
* *m* Persei		6.0	4	25	40.548	+ 4.2103	+ 42	49	40.82	8.002
A Draconis	S. P.	5.0	4	28	12.176	− 0.1347	+110	59	38.67	7.798
α Tauri (*Aldebaran*)		1.0	4	29	36.514	+ 3.4375	+ 16	17	15.02	7.514
* τ Tauri		4.5	4	35	38.557	3.5954	+ 22	44	42.48	7.184
α Camelopardalis		4.4	4	43	6.816	+ 5.9254	+ 66	9	16.65	+ 6.600
* *i* Tauri		5.2	4	44	56.345	3.5054	+ 18	39	6.76	6.405
ι Aurigæ		2.8	4	49	49.815	3.9007	+ 32	59	28.24	6.023
* ζ Aurigæ		3.9	4	54	47.343	+ 4.1852	+ 40	54	52.07	5.623
ε Ursæ Minoris	S. P.	4.5	4	57	15.610	− 6.3298	+ 97	46	57.87	5.424
11 Orionis		4.7	4	58	16.979	+ 3.4244	+ 15	15	0.68	+ 5.296
* β Eridani		2.9	5	2	26.514	2.9485	− 5	13	45.05	4.925
α Aurigæ (*Capella*)		0.1	5	8	33.790	4.4248	+ 45	53	6.69	4.028
β Orionis (*Rigel*)		0.3	5	9	15.078	2.8813	− 8	19	45.52	4.398
* τ Orionis		3.8	5	12	15.907	+ 2.9126	− 6	57	50.43	+ 4.135

* Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

MEAN PLACES FOR 1890.0. (January $0^d.0$–$0^d.320$, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
β Tauri . . .	1.8	5 19 20.296	+ 3.7893	+ 28 30 49.48	+ 3.359
Groombridge 966 .	6.4	5 25 1.555	8.0011	+ 74 58 9.71	3.068
* χ Aurigæ . . .	5.0	5 25 34.178	3.9050	+ 32 6 36.72	3.022
δ Orionis (*var.*) . .	2.3	5 26 23.209	3.0634	− 0 22 52.33	2.926
* Groombridge 944 .	6.4	5 26 48.346	18.6553	+ 85 8 22.54	2.907
α Leporis . . .	2.7	5 27 52.718	+ 2.6448	− 17 54 5.62	+ 2.801
ε Orionis . . .	1.8	5 30 37.893	3.0423	− 1 16 22.00	2.563
α Columbæ . .	2.7	5 35 40.012	+ 2.1728	− 34 7 59.66	2.080
ω Draconis . . S. P.	4.9	5 37 35.802	− 0.3538	+111 11 28.70	1.633
* κ Orionis . . .	2.3	5 42 32.340	+ 2.8447	− 9 42 33.46	1.530
* ν Aurigæ . . .	4.1	5 43 51.920	+ 4.1541	+ 39 6 55.48	+ 1.447
ψ^1 Draconis . . S. P.	4.8	5 43 53.677	− 1.0790	+107 47 50.80	1.681
* δ Doradus . . .	4.4	5 44 34.754	+ 0.1048	− 65 46 36.21	1.328
α Orionis (*var.*) . .	0.9	5 49 12.985	3.2470	+ 7 23 9.13	0.950
* β Aurigæ . . .	2.0	5 51 27.611	4.4017	+ 44 56 6.98	0.737
* θ Aurigæ . . .	2.9	5 52 13.256	+ 4.0920	+ 37 12 14.65	+ 0.592
ν Orionis . . .	4.5	6 1 17.544	3.4274	+ 14 46 51.14	− 0.143
22 Camelopardalis (H.)	4.7	6 6 43.203	+ 6.6173	+ 69 21 25.58	0.706
δ Ursæ Minoris . S. P.	4.4	6 7 47.641	−19.4660	+ 93 23 18.24	0.733
* η Geminorum . .	3.5	6 8 14.299	+ 3.6227	+ 22 32 16.75	0.737
μ Geminorum . .	3.2	6 16 18.374	+ 3.6314	+ 22 34 9.30	− 1.547
* ψ^1 Aurigæ . . .	5.1	6 16 25.617	4.6265	+ 49 20 35.10	1.447
α Argûs (*Canopus*) .	0.8	6 21 30.686	1.3305	− 52 38 8.67	1.871
* ν Geminorum . .	4.2	6 22 25.890	+ 3.5630	+ 20 16 51.64	1.982
* χ Draconis . . S. P.	5.3	6 23 2.336	− 1.0796	+107 18 54.53	1.637
γ Geminorum . .	2.0	6 31 21.441	+ 3.4673	+ 16 29 32.91	− 2.783
* ε Geminorum . .	3.2	6 37 9.846	3.6933	+ 25 14 21.57	3.251
* ψ^5 Aurigæ . . .	5.4	6 38 48.577	4.3290	+ 43 41 9.74	3.232
† α Canis Majoris (*Sirius*)	1.4	6 40 18.058	2.6436	− 16 33 56.72	4.715
* θ Geminorum . .	3.7	6 45 32.371	3.9605	+ 34 5 35.56	3.990
51 Cephei (H.) . .	5.3	6 48 45.293	+29.8910	+ 87 13 5.07	− 4.325
* ζ Mensæ . .	5.6	6 49 11.560	− 4.9050	− 80 41 49.43	4.190
50 Draconis . S. P.	5.6	6 49 55.057	− 1.9083	+104 41 45.90	4.408
ε Canis Majoris . .	1.5	6 54 18.189	+ 2.3577	− 28 49 22.57	4.720
* ζ Geminorum (*var.*) .	4.0	6 57 35.122	3.5624	+ 20 43 51.21	5.004
δ Canis Majoris . .	1.9	7 3 55.116	+ 2.4385	− 26 13 8.09	− 5.511
* 63 Aurigæ . . .	5.2	7 4 5.364	4.1365	+ 39 29 57.63	5.516
* 25 Camelopardalis .	5.3	7 7 54.651	+12.9563	+ 82 37 16.44	5.886
* γ^2 Volantis (*var.*) .	3.9	7 9 40.588	− 0.4938	− 70 19 13.87	6.004
δ Draconis . . S. P.	3.1	7 12 31.739	+ 0.0294	+112 31 55.06	6.326
δ Geminorum . .	3.5	7 13 33.220	+ 3.5879	+ 22 11 3.02	− 6.342
τ Draconis . . S. P.	4.5	7 17 40.021	− 1.1173	+106 50 56.14	6.775
Piazzi vii. 67 . .	5.7	7 19 25.989	+ 6.2981	+ 68 41 21.33	6.849
* β Canis Minoris . .	3.1	7 21 11.154	3.2597	+ 8 30 37.08	6.993
α^2 Geminorum (*Castor*)	1.9	7 27 34.932	3.8384	+ 32 7 45.14	7.555
† α Canis Min. (*Procyon*)	0.5	7 33 32.622	+ 3.1434	+ 5 30 22.76	− 8.996
λ Ursæ Minoris . S. P.	6.5	7 33 35.144	−65.0520	+ 91 1 59.44	7.972
β Geminorum (*Pollux*)	1.2	7 38 35.097	+ 3.6791	+ 28 17 28.45	8.419
* 26 Lyncis . . .	5.8	7 46 42.099	4.3880	+ 47 50 56.00	9.023
φ Geminorum . .	5.0	7 46 45.924	+ 3.6799	+ 27 2 59.79	− 9.032

* Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

† Periodic corrections given in the Appendix are still to be applied to the positions of Sirius and Procyon.

MEAN PLACES FOR 1890.0. (January $0^d.0-0^d.320$, Washington.)

Name of Star.		Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
			h	m	s	s	°	′	″	″
* Croombridge 1374 .		5.6	7	47	0.996	+ 7.2848	+ 74	12	37.77	− 9.061
ε Draconis . .	S. P.	3.9	7	48	32.455	− 0.1795	+110	0	43.99	9.173
* ω^1 Cancri . . .		6.0	7	54	16.550	+ 3.6372	+ 25	41	36.54	9.581
3 Ursæ Majoris (H.) .		5.5	8	1	51.832	6.0483	+ 68	47	48.57	10.164
15 Argûs (ρ) . .		3.1	8	2	51.569	2.5545	− 23	59	15.31	10.196
* ζ^1 Cancri . . .		4.8	8	5	54.198	+ 3.4464	+ 17	58	42.14	− 10.606
* β Cancri . . .		3.8	8	10	32.981	+ 3.2585	+ 9	31	26.07	10.839
κ Cephei (*pr.*) .	S. P.	4.4	8	12	34.958	− 1.9241	+102	37	12.41	10.993
* 30 Monocerotis . .		3.9	8	20	9.822	+ 3.0000	− 3	32	52.72	11.508
* θ Chamæleontis . .		4.6	8	23	55.619	− 1.7113	− 77	7	45.50	11.760
η Cancri . . .		5.4	8	26	20.894	+ 3.4782	+ 20	48	51.47	− 12.006
Groombr. 3241 .	S. P.	6.5	8	30	28.661	− 0.2203	+107	50	27.66	12.221
* σ Hydræ . . .		4.5	8	33	0.587	+ 3.1458	+ 3	43	37.60	12.436
* γ Cancri . . .		4.9	8	36	55.231	3.4804	+ 21	51	48.69	12.726
ε Hydræ . . .		3.5	8	40	57.069	3.1817	+ 6	49	18.88	13.007
* σ^2 Cancri (*mean*) . .		5.5	8	47	31.980	+ 3.6734	+ 30	59	43.70	− 13.409
ι Ursæ Majoris . .		3.3	8	51	40.466	+ 4.1331	+ 48	28	22.75	13.907
12 Year Cat. 1879	S. P.	5.3	8	52	33.651	− 2.5509	+ 99	51	38.16	13.682
σ^2 Ursæ Majoris . .		5.0	9	0	42.512	+ 5.3540	+ 67	34	49.76	14.279
κ Cancri . . .		5.1	9	1	47.390	3.2558	+ 11	6	37.88	14.293
* θ Hydræ . . .		4.0	9	8	38.509	+ 3.1261	+ 2	46	40.41	− 15.019
* β Argûs . . .		2.0	9	11	59.413	0.6775	− 69	15	50.83	14.806
ι Argûs . . .		2.6	9	14	8.575	1.6011	− 58	48	48.59	14.998
* α Lyncis . . .		3.3	9	14	21.149	3.6690	+ 34	51	25.48	15.028
α Cephei . .	S. P.	2.6	9	15	57.256	1.4365	+117	52	49.54	15.173
1 Draconis (H.) . .		4.5	9	21	21.767	+ 8.9948	+ 81	48	41.93	− 15.457
α Hydræ . . .		2.1	9	22	10.925	2.9491	− 8	10	55.80	15.453
d Ursæ Majoris . .		4.8	9	24	44.723	5.4000	+ 70	18	47.32	15.564
θ Ursæ Majoris . .		3.2	9	25	29.797	4.0408	+ 52	10	41.33	16.221
β Cephei (*pr.*) .	S. P.	3.4	9	27	14.305	0.7939	+109	55	19.92	15.757
* 10 Leonis Minoris .		4.7	9	27	29.072	+ 3.6940	+ 36	53	8.02	− 15.785
* ο Leonis . . .		3.8	9	35	16.783	+ 3.2069	+ 10	23	32.60	16.224
* ζ Chamæleontis . .		5.2	9	37	6.375	− 1.5640	− 80	26	48.98	16.286
ε Leonis . . .		3.2	9	39	36.432	+ 3.4150	+ 24	16	49.30	16.428
11 Cephei . .	S. P.	4.8	9	40	18.633	0.9011	+109	11	41.95	16.539
μ Leonis . . .		4.0	9	46	30.440	+ 3.4220	+ 26	31	28.93	− 16.799
* 19 Leonis Minoris .		5.2	9	50	56.805	3.6951	+ 41	34	44.86	16.964
79 Draconis . .	S. P.	6.6	9	51	29.637	0.7289	+106	49	4.93	17.014
* π Leonis . . .		5.0	9	54	24.029	3.1743	+ 8	34	17.93	17.141
α Leonis (***Regulus***) .		1.3	10	2	30.829	3.2005	+ 12	30	16.36	17.476
32 Ursæ Majoris . .		5.7	10	10	2.446	+ 4.4202	+ 65	39	23.71	− 17.815
* λ Ursæ Majoris . .		3.6	10	10	27.682	3.6394	+ 43	27	47.16	17.875
γ^1 Leonis . . .		2.5	10	13	54.470	3.3148	+ 20	23	51.77	18.088
* μ Hydræ . . .		4.1	10	20	46.271	2.9007	− 16	16	30.99	18.312
* β Leonis Minoris .		4.3	10	21	31.323	3.4864	+ 37	16	14.39	18.316
* α Antliæ . . .		4.5	10	22	7.078	+ 2.7392	− 30	30	29.81	− 18.219
9 Draconis (H.) . .		5.0	10	25	44.265	5.2613	+ 76	16	45.11	18.397
ρ Leonis . . .		4.0	10	27	1.184	3.1641	+ 9	52	20.56	18.434
226 Cephei (B.) .	S. P.	5.7	10	30	20.536	1.0773	+104	20	25.64	18.529
* β Octantis . .	S. P.	4.4	10	34	46.485	+ 6.4810	− 98	2	32.67	− 18.684

* Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

MEAN PLACES FOR 1890.0. (January $0^d.0-0^d.320$, Washington.)

Name of Star.		Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
			h	m	s	s	°	′	″	″
* 41 Leonis Minoris . .		5.1	10	37	26.084	+ 3.2707	+ 23	45	50.70	— 18.740
η Argûs (*var.*) . .		1–6	10	40	47.590	2.3136	— 59	6	22.70	18.871
l Leonis . . .		5.3	10	43	28.545	3.1585	+ 11	7	37.42	18.974
* δ^2 Chamæleontis . .		4.7	10	44	44.889	0.6372	— 79	57	37.02	18.982
ι Cephei . .	S. P.	3.6	10	45	45.801	2.1220	+114	22	41.35	18.878
* 46 Leonis Minoris .		3.9	10	47	9.560	+ 3.3694	+ 34	48	28.49	— 19.297
* Groombridge 1706 .		6.3	10	51	8.344	4.9680	+ 78	21	33.47	19.183
α Ursæ Majoris . .		2.0	10	56	56.140	+ 3.7470	+ 62	20	40.99	19.365
* η Octantis . . .		6.1	11	0	4.954	— 0.2159	— 84	0	7.74	19.372
* p^3 Leonis . . .		6.2	11	1	17.569	+ 3.0620	+ 2	33	8.46	19.488
* ψ Ursæ Majoris . .		3.2	11	3	28.672	+ 3.3931	+ 45	5	41.61	— 19.505
δ Leonis . . .		2.7	11	8	15.501	3.1982	+ 21	7	34.41	19.687
* ν Ursæ Majoris . .		3.7	11	12	32.354	3.2575	+ 33	41	40.08	19.574
δ Crateris . . .		3.9	11	13	50.494	2.9964	— 14	11	0.60	19.465
ο Cephei . .	S. P.	5.1	11	14	6.666	2.4442	+112	29	24.77	19.670
τ Leonis . . .		5.1	11	22	16.814	+ 3.0861	+ 3	27	42.97	— 19.803
λ Draconis . . .		4.0	11	24	51.998	3.6208	+ 69	56	17.14	19.839
* ξ Hydræ . . .		3.8	11	27	35.482	2.9430	— 31	14	56.95	19.886
υ Leonis . . .		4.4	11	31	19.002	3.0713	— 0	12	59.59	19.861
γ Cephei . .	S. P.	3.5	11	34	49.965	2.4158	+102	58	54.03	20.076
* χ Ursæ Majoris . .		3.9	11	40	14.477	+ 3.1902	+ 48	23	21.26	— 19.962
β Leonis . . .		2.2	11	43	26.931	3.0640	+ 15	11	12.85	20.120
γ Ursæ Majoris . .		2.4	11	48	2.664	3.1816	+ 54	18	22.46	20.027
Groombr. 4163 .	S. P.	7.0.	11	49	29.210	2.8656	+106	12	6.63	20.023
* π Virginis . . .		4.6	11	55	14.152	3.0751	+ 7	13	39.62	20.088
ο Virginis . . .		4.3	11	59	36.340	+ 3.0576	+ 9	20	38.13	— 20.015
* ε Corvi . . .		3.2	12	4	28.033	3.0830	— 22	0	28.56	20.049
4 Draconis (H.) . .		5.1	12	7	2.791	2.8853	+ 78	13	38.98	20.022
γ Corvi . . .		2.7	12	10	8.967	3.0796	— 16	55	52.20	20.017
* 2 Canum Venaticorum		6.0	12	10	36.826	3.0220	+ 41	16	21.45	20.065
β Chamæleontis . .		4.5	12	11	54.277	+ 3.4012	— 78	42	4.37	— 20.003
η Virginis . . .		4.0	12	14	16.700	3.0686	— 0	3	19.91	20.042
* 6 Ursæ Minoris . .		6.2	12	14	20.390	0.1610	+ 88	18	35.43	19.940
α^1 Crucis . . .		0.9	12	20	29.022	3.2956	— 62	29	21.69	20.014
* δ^2 Corvi . . .		3.1	12	24	10.490	3.1026	— 15	54	10.01	20.084
* β Canum Venaticorum		4.4	12	28	31.116	+ 2.8594	+ 41	57	18.69	— 19.615
β Corvi . . .		2.8	12	28	36.548	3.1417	— 22	47	18.26	19.963
κ Draconis . . .		3.8	12	28	47.225	2.5916	+ 70	23	40.44	19.889
* γ Virginis (*mean*) .		2.9	12	36	5.211	3.0383	— 0	50	46.39	19.815
21 Cassiopeæ .	S. P.	5.7	12	38	23.220	3.8585	+105	36	47.93	19.752
* 31 Comæ Berenices .		5.1	12	46	20.525	+ 2.9301	+ 28	8	21.28	— 19.661
32^2 Camelopardalis (H.) .		5.2	12	48	19.458	0.3939	+ 84	0	38.76	19.596
* γ Cassiopeæ .	S. P.	2.3	12	50	4.280	3.5794	+119	52	45.04	19.563
α Canum Venaticorum		3.2	12	50	52.960	2.8154	+ 38	54	44.92	19.512
* 43 Cephei (H.) .	S. P.	4.6	12	53	48.198	7.2427	+ 94	20	0.00	19.502
* δ Muscæ . . .		3.8	12	54	43.120	+ 4.1350	— 70	57	18.12	— 19.475
* ε Virginis . . .		3.1	12	56	42.103	2.9880	+ 11	33	1.62	19.417
θ Virginis . . .		4.6	13	4	15.250	3.1012	— 4	57	5.91	19.312
* 20 Canum Venaticorum		4.7	13	12	36.599	2.6967	+ 41	9	6.49	19.035
α Urs. Min. (*Polaris*)	S. P.	2.2	13	18	31.136	+23.3310	+ 91	16	41.60	— 18.887

* Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

MEAN PLACES FOR 1890.0. (January 0^d.0–0^d.320, Washington.)

Name of Star.		Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
			h	m	s	s	°	′	″	″
α Virginis (*Spica*) .		1.1	13	19	23.866	+ 3.1538	− 10	35	13.36	− 18.900
38 Cassiopeæ .	S. P.	5.9	13	23	2.928	4.3786	+110	18	6.72	18.675
* κ Octantis . . .		5.4	13	23	15.630	8.7534	− 85	13	17.68	18.776
ζ Virginis . . .		3.6	13	29	5.275	3.0532	− 0	1	59.91	18.517
* B. A. C. 4536 . .		5.0	13	29	53.069	2.6823	+ 37	44	45.81	18.538
* m Virginis . . .		5.4	13	35	50.317	+ 3.1433	− 8	8	51.71	− 18.289
η Ursæ Majoris . .		1.9	13	43	12.411	2.3712	+ 49	51	44.45	18.078
η Bootis . . .		2.8	13	49	26.838	2.8568	+ 18	56	57.64	18.170
50 Cassiopeæ .	S. P.	4.1	13	54	2.842	5.0122	+108	6	41.10	17.644
* θ Apodis . . .		Var.	13	54	37.836	5.6763	− 76	15	53.50	17.590
β Centauri . . .		0.7	13	56	3.652	+ 4.1782	− 59	50	31.31	− 17.589
* π Hydræ . . .		3.6	14	0	6.408	3.4010	− 26	9	5.39	17.363
α Draconis . . .		3.7	14	1	24.730	1.6238	+ 64	54	5.71	17.299
* d Bootis . . .		4.8	14	5	22.973	2.7387	+ 25	36	46.50	17.200
* κ Virginis . . .		4.2	14	7	1.687	+ 3.1939	− 9	45	41.44	16.928
* 4 Ursæ Minoris . .		4.9	14	9	17.022	− 0.3219	+ 78	3	52.05	− 16.907
* δ Octantis . . .		5.0	14	9	21.345	+ 8.9830	− 83	9	46.05	16.951
α Bootis (*Arcturus*) .		0.2	14	10	38.654	2.7350	+ 19	45	19.10	18.853
* λ Bootis . . .		4.3	14	12	12.109	2.2827	+ 46	35	36.82	16.659
* λ Virginis . . .		4.7	14	13	9.467	3.2380	− 12	51	52.13	16.728
ι Cassiopeæ .	S. P.	4.6	14	20	0.151	+ 4.8630	+113	5	33.80	− 16.431
θ Bootis . . .		4.1	14	21	27.184	2.0442	+ 52	21	33.50	16.761
ρ Bootis . . .		3.6	14	27	5.424	+ 2.5877	+ 30	51	15.98	15.960
5 Ursæ Minoris . .		4.5	14	27	45.799	− 0.1896	+ 76	11	5.85	16.012
α^2 Centauri . . .		0.1	14	32	9.045	+ 4.0464	− 60	23	2.62	15.375
* μ Hydri . .	S. P.	5.3	14	34	0.541	− 1.4339	−100	24	39.76	− 15.682
* α Apodis . . .		4.1	14	34	13.678	+ 7.1963	− 78	34	37.28	15.714
* 33 Bootis . . .		5.3	14	34	44.608	2.2343	+ 44	52	45.42	15.710
ε Bootis . . .		2.6	14	40	11.043	2.6213	+ 27	32	17.44	15.341
α^2 Libræ . . .		2.9	14	44	47.562	+ 3.3096	− 15	35	3.54	15.168
β Ursæ Minoris . .		2.2	14	51	1.826	− 0.2304	+ 74	36	18.05	− 14.719
* 47 Cephei (H.) .	S. P.	5.7	14	51	28.829	+ 7.7244	+101	1	1.81	14.692
* γ Scorpii . . .		3.4	14	57	37.991	3.5022	− 24	50	56.69	14.355
β Bootis . . .		3.7	14	57	48.177	2.2601	+ 40	49	28.60	14.361
48 Cephei (H.) .	S. P.	5.5	15	6	22.699	7.4089	+102	40	14.02	13.727
* δ Bootis . . .		3.5	15	11	4.126	+ 2.4209	+ 33	43	32.21	− 13.583
β Libræ . . .		2.9	15	11	5.254	3.2218	− 8	58	36.01	13.508
* ρ Octantis . . .		5.7	15	18	0.874	12.9858	− 84	5	47.09	12.978
μ^1 Bootis . . .		4.5	15	20	20.118	+ 2.2662	+ 37	45	47.75	12.779
γ^2 Ursæ Minoris . .		3.2	15	20	54.411	− 0.1332	+ 72	13	31.46	12.811
* β Coronæ Borealis .		3.9	15	23	17.657	+ 2.4751	+ 29	29	6.12	− 12.594
α Coronæ Borealis .		2.3	15	30	1.855	2.5393	+ 27	5	6.64	12.305
* γ Camelop. (H.) .	S. P.	4.6	15	38	45.121	6.2393	+109	0	27.98	11.541
α Serpentis . . .		2.7	15	38	50.987	2.9516	+ 6	46	19.22	11.550
ε Serpentis . . .		3.7	15	45	19.969	+ 2.9872	+ 4	48	33.49	11.048
ζ Ursæ Minoris . .		4.6	15	47	59.941	− 2.2503	+ 78	7	57.23	− 10.923
ε Coronæ Borealis .		4.1	15	53	2.075	+ 2.4832	+ 27	11	48.23	10.611
δ Scorpii . . .		2.6	15	53	49.763	3.5388	− 22	18	29.04	10.527
β^1 Scorpii . . .		2.9	15	59	2.472	3.4809	− 19	30	13.92	10.138
* δ^1 Apodis . . .		4.9	16	3	55.733	+ 8.7763	− 78	25	0.64	− 9.728

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MEAN PLACES FOR 1890.0. (January 0d.0—0d.320, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
* φ Herculis . . .	4.2	16 5 18.033	+ 1.8813	+ 45 13 24.75	− 9.581
Groombridge 2320 .	5.5	16 6 1.183	0.1400	+ 68 6 0.14	9.498
δ Ophiuchi . . .	2.8	16 8 34.863	3.1397	− 3 24 38.13	9.513
* σ Coronæ Borealis (*mean*)	5.3	16 10 33.493	2.2447	+ 34 8 16.15	9.256
τ Herculis . . .	3.9	16 16 26.088	1.8011	+ 46 34 31.51	8.734
* γ Apodis . . .	4.0	16 16 36.215	+ 9.0657	− 78 38 55.17	− 8.744
* η Ursæ Minoris . .	5.0	16 20 43.473	− 1.8158	+ 76 0 30.97	8.163
η Draconis . . .	2.0	16 22 30.255	+ 0.8064	+ 61 45 47.67	8.221
α Scorpii (*Antares*) .	1.2	16 22 39.767	3.6703	− 26 11 14.22	8.300
β Herculis . . .	2.8	16 25 29.476	+ 2.5775	+ 21 43 46.99	8.056
A Draconis . . .	5.0	16 28 12.176	− 0.1347	+ 69 0 21.33	− 7.798
ζ Ophiuchi . . .	2.8	16 31 6.103	+ 3.2991	− 10 20 37.51	7.563
α Trianguli Australis .	2.2	16 37 1.376	6.3042	− 68 49 27.66	7.153
η Herculis . . .	3.7	16 39 7.464	2.0538	+ 39 7 54.27	7.021
α Camelopardalis S. P.	4.4	16 43 6.816	5.9254	+113 50 43.35	6.600
κ Ophiuchi . . .	3.4	16 52 27.705	+ 2.8375	+ 9 32 47.55	− 5.830
ε Ursæ Minoris . .	4.5	16 57 15.610	− 6.3298	+ 82 13 2.13	5.424
d Herculis . . .	5.3	16 57 32.684	+ 2.2113	+ 33 43 40.47	5.395
* η Ophiuchi . . .	2.5	17 4 4.146	3.4370	− 15 35 17.14	4.736
α^1 Herculis (*var.*) .	3.1	17 9 37.905	2.7335	+ 14 30 58.15	4.344
* π Herculis . . .	3.4	17 11 12.973	+ 2.0891	+ 36 56 0.28	− 4.228
* θ Ophiuchi . . .	3.3	17 15 15.220	3.6792	− 24 53 20.91	3.941
b Ophiuchi (*var.*) .	4.4	17 19 39.141	3.6591	− 24 4 24.29	3.643
* δ Aræ . . .	3.8	17 21 10.294	5.4017	− 60 35 28.40	3.522
Groombr. 966 . S. P.	6.4	17 25 1.555	8.0011	+105 1 50.29	3.068
* Groombr. 944 . S. P.	6.4	17 26 48.346	+18.6553	+ 94 51 37.46	− 2.907
β Draconis . . .	3.0	17 27 56.871	1.3534	+ 52 22 58.41	2.796
α Ophiuchi . . .	2.2	17 29 49.699	2.7829	+ 12 38 25.94	2.869
* ι Herculis . . .	4.0	17 36 21.700	+ 1.6966	+ 46 3 54.18	2.066
ω Draconis . . .	4.9	17 37 35.802	− 0.3538	+ 68 48 31.30	1.633
μ Herculis . . .	3.5	17 42 9.239	+ 2.3464	+ 27 47 6.98	− 2.320
ψ^1 Draconis . . .	4.8	17 43 53.677	− 1.0790	+ 72 12 9.20	1.681
* θ Herculis . . .	3.9	17 52 28.809	+ 2.0551	+ 37 15 55.45	0.639
γ Draconis . . .	2.5	17 54 3.114	1.3915	+ 51 30 6.96	0.550
γ^3 Sagittarii . . .	2.9	17 58 44.487	3.8515	− 30 25 29.09	− 0.329
* ο Herculis . . .	3.9	18 3 15.106	+ 2.3394	+ 28 44 51.58	+ 0.287
22 Camelop. (H.) . S. P.	4.7	18 6 43.203	6.6173	+110 38 34.42	0.706
μ^1 Sagittarii . . .	4.1	18 7 11.098	+ 3.5866	− 21 5 12.94	0.616
δ Ursæ Minoris . .	4.4	18 7 47.641	−19.4660	+ 86 36 41.76	0.733
η Serpentis . . .	3.5	18 15 37.076	+ 3.1023	− 2 55 35.65	0.691
* λ Sagittarii . . .	2.9	18 21 10.919	+ 3.7027	− 25 28 54.78	+ 1.641
* χ Draconis . . .	5.3	18 23 2.336	− 1.0796	+ 72 41 5.47	1.637
1 Aquilæ . . .	4.0	18 29 13.272	+ 3.2645	− 8 19 13.84	2.220
* ζ Pavonis . . .	4.2	18 30 10.680	- 7.0290	− 71 31 13.40	2.502
α Lyræ (*Vega*) . .	0.2	18 33 12.865	2.0313	+ 38 40 53.36	3.169
σ Octantis . . .	5.6	18 42 23.102	+105.9460	− 89 16 1.15	+ 3.668
β Lyræ (*var.*) . .	3.6	18 46 1.137	2.2142	+ 33 14 6.59	3.982
σ Sagittarii . . .	2.3	18 48 26.669	3.7216	− 26 25 57.67	4.130
51 Cephei (H.) . S. P.	5.3	18 48 45.293	+29.8910	+ 92 46 54.93	4.325
50 Draconis . . .	5.6	18 49 55.057	− 1.9083	+ 75 18 14.10	+ 4.408

*Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

MEAN PLACES FOR 1890.0. (January 0d.0—0d.320, Washington.)

Name of Star.		Magni-tude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
			h m s	s	° ′ ″	″
* γ Lyræ . . .		3.3	18 54 49.746	+ 2.2443	+ 32 32 20.46	+ 4.763
ζ Aquilæ . . .		3.1	19 0 21.265	2.7569	+ 13 42 1.33	5.116
* ι Lyræ . . .		5.2	19 3 22.625	2.1411	+ 35 55 40.96	5.484
* 25 Camelopardalis	S. P.	5.3	19 7 54.651	12.9563	+ 97 22 43.56	5.886
d Sagittarii . . .		5.0	19 11 11.926	3.5122	— 19 8 52.96	6.112
δ Draconis . . .		3.1	19 12 31.739	+ 0.0294	+ 67 28 4.94	+ 6.336
* θ Lyræ . . .		4.4	19 12 32.949	+ 2.0789	+ 37 56 16.72	6.244
τ Draconis . . .		4.5	19 17 40.021	— 1.1173	+ 73 9 3.86	6.775
Piazzi vii. 67 .	S. P.	5.7	19 19 25.989	+ 6.2981	+111 18 38.67	6.849
δ Aquilæ . . .		3.5	19 19 57.128	3.0252	+ 2 53 45.30	6.931
* β Cygni . . .		3.1	19 26 17.123	+ 2.4193	+ 27 43 44.18	+ 7.365
κ Aquilæ . . .		5.0	19 30 58.404	+ 3.2289	— 7 16 17.26	7.753
λ Ursæ Minoris . .		6.5	19 33 35.144	—65.0520	+ 88 58 0.56	7.972
* β Sagittæ . . .		4.5	19 36 6.516	+ 2.6955	+ 17 13 17.10	8.137
γ Aquilæ . . .		2.8	19 41 1.810	2.8522	+ 10 20 44.10	8.547
* δ Cygni . . .		2.9	19 41 32.249	+ 1.8761	+ 44 51 44.72	+ 8.652
α Aquilæ (*Altair*) .		0.9	19 45 24.987	2.9276	+ 8 34 41.41	9.273
* Groombr. 1374 .	S. P.	5.6	19 47 0.996	7.2848	+105 47 22.23	9.061
* ε Pavonis . . .		4.1	19 47 51.280	+ 7.0187	— 73 11 56.19	9.092
ε Draconis . . .		3.9	19 48 32.455	— 0.1795	+ 69 59 16.01	9.173
β Aquilæ . . .		3.9	19 49 54.602	+ 2.9471	+ 6 7 56.46	+ 8.761
* γ Sagittæ . . .		3.6	19 53 51.923	2.6678	+ 19 11 37.69	9.596
* c Sagittarii . . .		4.5	19 55 53.564	3.6948	— 28 0 54.21	9.733
τ Aquilæ . . .		5.7	19 58 46.030	2.9330	+ 6 58 4.27	9.940
3 Ursæ Majoris (H.)	S. P.	5.5	20 1 51.832	6.0483	+111 12 11.43	10.164
* θ Aquilæ . . .		3.3	20 5 37.721	+ 3.0974	— 1 8 50.68	+ 10.459
* 31 Cygni . . .		3.9	20 10 10.085	1.8893	+ 46 24 28.33	10.790
α² Capricorni . .		3.7	20 11 57.082	+ 3.3321	— 12 53 7.11	10.918
κ Cephei (*pr.*) . .		4.4	20 12 34.958	— 1.9241	+ 77 22 47.59	10.993
α Pavonis . . .		2.0	20 16 56.980	+ 4.7837	— 57 5 11.90	11.191
γ Cygni . . .		2.3	20 18 16.937	+ 2.1537	+ 39 54 17.10	+ 11.372
π Capricorni . .		5.1	20 21 1.512	3.4396	— 18 34 18.74	11.558
ε Delphini . . .		4.0	20 27 57.491	+ 2.8672	+ 10 55 47.44	12.043
Groombridge 3241 .		6.5	20 30 28.661	— 0.2203	+ 72 9 32.34	12.221
* α Delphini . . .		3.9	20 34 31.726	+ 2.7878	+ 15 31 27.35	12.522
* β Pavonis . . .		3.4	20 35 2.452	+ 5.4734	— 66 35 50.70	+ 12.532
α Cygni . . .		1.4	20 37 40.939	2.0444	+ 44 53 14.59	12.725
* ψ Capricorni . .		4.3	20 39 34.838	3.5584	— 25 39 56.74	12.691
* ε Cygni . . .		2.6	20 41 45.638	2.4277	+ 33 33 30.05	13.341
μ Aquarii . . .		4.8	20 46 43.255	+ 3.2397	— 9 23 44.66	13.291
12 Year Catalogue, 1879.		5.3	20 52 33.651	— 2.5509	+ 80 8 21.84	+ 13.682
ν Cygni . . .		4.1	20 53 4.334	+ 2.2342	+ 40 44 37.83	13.726
σ² Ursæ Majoris .	S. P.	5.0	21 0 42.512	5.3540	+112 25 10.24	14.279
61¹ Cygni . . .		5.4	21 1 57.963	2.6832	+ 38 12 31.13	17.533
ζ Cygni . . .		3.3	21 8 15.245	2.5497	+ 29 46 33.15	14.611
* τ Cygni . . .		3.8	21 10 24.029	+ 2.3935	+ 37 34 33.75	+ 15.264
α Cephei . . .		2.6	21 15 57.256	1.4365	+ 62 7 10.46	15.173
1 Pegasi . . .		4.3	21 16 59.932	2.7722	+ 19 20 2.70	15.242
* ζ Capricorni . .		3.8	21 20 23.135	3.4325	— 22 53 14.58	15.403
1 Draconis (H.) .	S. P.	4.5	21 21 21.767	+ 8.9948	+ 98 11 18.07	+ 15.457

Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

MEAN PLACES FOR 1890.0. (January 0ᵈ.0—0ᵈ.320, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
d Ursæ Majoris . S. P.	4.8	21 24 44.723	+ 5.4006	+109 41 12.68	+ 15.564
β Aquarii . . .	2.9	21 25 46.100	3.1617	− 6 3 17.43	15.664
β Cephei (*pr.*) . .	3.4	21 27 14.305	0.7939	+ 70 4 40.08	15.757
ξ Aquarii . . .	4.8	21 31 53.792	3.1979	− 8 20 50.08	15.974
* 74 Cygni . . .	5.0	21 32 32.411	2.4015	+ 39 55 9.64	16.053
* λ^1 Octantis . . .	5.4	21 33 58.269	+ 9.7817	− 83 13 26.14	+ 16.039
* ζ Chamæleontis . S. P.	5.2	21 37 6.375	− 1.5640	− 99 33 11.02	16.286
ε Pegasi . . .	2.4	21 38 47.025	+ 2.9467	+ 9 22 15.27	16.359
11 Cephei . . .	4.8	21 40 18.633	0.9011	+ 70 48 18.05	16.539
* π^2 Cygni . . .	4.5	21 42 43.780	2.2133	+ 48 48 2.75	16.545
μ Capricorni . .	5.2	21 47 17.928	+ 3.2760	− 14 4 9.58	+ 16.782
* 16 Pegasi . . .	5.3	21 48 3.421	2.7278	+ 25 24 27.92	16.821
79 Draconis . . .	6.6	21 51 29.637	0.7289	+ 73 10 55.07	17.014
α Aquarii . . .	3.0	22 0 8.048	3.0827	− 0 51 14.55	17.358
α Gruis . . .	1.9	22 1 17.891	3.8058	− 47 29 35.71	17.250
* π Pegasi . . .	4.3	22 5 6.135	+ 2.6601	+ 32 38 19.35	+ 17.582
32 Ursæ Majoris . S. P.	5.7	22 10 2.446	4.4202	+114 20 36.29	17.815
* υ Octantis . . .	6.2	22 10 24.934	13.1584	− 86 31 32.15	17.891
θ Aquarii . . .	4.4	22 11 1.751	3.1691	− 8 19 50.97	17.804
* γ Aquarii . . .	4.0	22 15 58.461	3.1008	− 1 56 29.34	18.041
π Aquarii . . .	4.6	22 19 39.578	+ 3.0647	+ 0 49 9.78	+ 18.157
* σ Aquarii . . .	4.9	22 24 49.453	3.1757	− 11 14 26.30	18.320
9 Draconis . . S. P.	5.0	22 25 44.265	5.2613	+103 43 14.89	18.397
* α Lacertæ . . .	3.9	22 26 45.573	2.4623	+ 49 43 1.19	18.417
η Aquarii . . .	4.2	22 29 42.232	3.0836	− 0 41 3.50	18.459
226 Cephei (B.) . .	5.7	22 30 20.536	+ 1.0773	+ 75 39 34.36	+ 18.529
* 10 Lacertæ . . .	5.0	22 34 19.535	2.6866	+ 38 28 40.25	18.671
* β Octantis . . .	4.4	22 34 46.485	6.4810	− 81 57 27.33	18.684
ζ Pegasi . . .	3.5	22 35 58.567	2.9909	+ 10 15 26.22	18.707
* λ Pegasi . . .	4.1	22 41 13.958	2.8852	+ 22 59 12.82	18.869
ι Cephei . . .	3.6	22 45 45.801	+ 2.1220	+ 65 37 18.65	+ 18.878
λ Aquarii . . .	3.8	22 46 52.571	3.1328	− 8 9 53.10	19.076
* Groombr. 1706 S. P.	6.3	22 51 8.344	4.9680	+101 38 26.53	19.183
α Pis. Aus. (*Fomalhaut*)	1.3	22 51 34.282	3.3247	− 30 12 18.32	18.995
* ο Andromedæ . .	3.8	22 56 51.596	2.7500	+ 41 44 5.00	19.288
α Ursæ Majoris . S. P.	2.0	22 56 56.140	+ 3.7470	+117 39 19.01	+ 19.364
α Pegasi (*Markab*) .	2.5	22 59 16.895	2.9850	+ 14 36 48.43	19.303
* φ Aquarii . . .	4.3	23 8 37.559	3.1088	− 6 38 30.64	19.359
ο Cephei . . .	5.1	23 14 6.666	2.4442	+ 67 30 35.23	19.670
* τ Pegasi . . .	4.6	23 15 11.544	2.9636	+ 23 8 17.37	19.657
θ Piscium . . .	4.3	23 22 23.282	+ 3.0411	+ 5 46 28.86	+ 19.728
λ Draconis . . S. P.	4.0	23 24 51.998	3.6208	+110 3 42.86	19.839
* λ Andromedæ . .	3.8	23 32 10.866	2.9223	+ 45 51 42.99	19.472
ι Piscium . . .	4.3	23 34 17.555	3.0841	+ 5 1 48.39	19.484
γ Cephei . . .	3.5	23 34 49.965	2.4158	+ 77 1 5.97	20.076
* i^1 Aquarii . . .	5.0	23 38 29.800	+ 3.1169	− 18 53 14.45	+ 19.960
* δ Sculptoris . .	4.3	23 43 11.778	3.1324	− 28 44 17.92	19.857
* γ^1 Octantis . . .	5.3	23 45 37.365	3.6880	− 82 37 48.59	19.993
Groombridge 4163 .	7.0	23 49 29.210	2.8656	+ 73 47 53.37	20.023
ω Piscium . . .	4.0	23 53 39.771	3.0784	+ 6 15 15.43	19 931
* 33 Piscium . . .	4.7	23 59 42.312	+ 3.0709	− 6 19 22.33	+ 20.143

* Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α* Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	*δ* Ursæ Minoris.		Mean Solar Date.	*λ* Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
Jan.	h m 1 18	° ′ +88 43	Jan.	h m 6 49	° ′ +87 13	Jan.	h m 18 7	° ′ +86 36	Jan.	h m 19 32	° ′ +88 57
	s	″		s	″		s	″		s	″
0.3	36.18	31.9	0.5	3.04	4.8	1.0	31.41	39.3	1.0	44.46	63.2
1.3	35.32	32.0	1.5	3.14	5.1	2.0	31.41	39.0	2.0	43.99	62.9
2.3	34.48	32.1	2.5	3.25	5.4	3.0	31.40	38.7	3.0	43.50	62.7
3.3	33.60	32.2	3.5	3.38	5.7	4.0	31.38	38.3	4.0	43.00	62.4
4.3	32.70	32.3	4.5	3.52	6.0	5.0	31.38	38.0	5.0	42.50	62.1
5.3	31.75	32.4	5.5	3.64	6.3	6.0	31.39	37.6	6.0	42.00	61.7
6.3	30.73	32.5	6.5	3.74	6.7	7.0	31.41	37.2	7.0	41.55	61.4
7.3	29.67	32.6	7.5	3.82	7.0	8.0	31.45	36.8	8.0	41.17	61.0
8.2	28.57	32.7	8.5	3.86	7.4	9.0	31.52	36.5	9.0	40.87	60.6
9.2	27.47	32.8	9.5	3.88	7.8	9.9	31.61	36.1	10.0	40.63	60.3
10.2	26.37	32.8	10.5	3.86	8.1	10.9	31.72	35.7	11.0	40.47	59.9
11.2	25.32	32.8	11.5	3.83	8.5	11.9	31.83	35.4	12.0	40.36	59.6
12.2	24.33	32.8	12.5	3.78	8.8	12.9	31.94	35.1	13.0	40.27	59.2
13.2	23.39	32.8	13.5	3.73	9.1	13.9	32.05	34.8	14.0	40.20	58.9
14.2	22.49	32.8	14.5	3.70	9.4	14.9	32.14	34.5	15.0	40.09	58.6
15.2	21.62	32.9	15.5	3.69	9.7	15.9	32.22	34.2	16.0	39.93	58.3
16.2	20.75	32.9	16.5	3.69	10.0	16.9	32.30	33.9	17.0	39.72	58.0
17.2	19.87	32.9	17.5	3.71	10.3	17.9	32.38	33.6	18.0	39.51	57.7
18.2	18.94	33.0	18.5	3.73	10.6	18.9	32.46	33.2	19.0	39.28	57.4
19.2	17.94	33.0	19.5	3.74	10.9	19.9	32.55	32.9	20.0	39.08	57.1
20.2	16.91	33.0	20.4	3.73	11.3	20.9	32.67	32.5	21.0	38.94	56.7
21.2	15.83	33.0	21.4	3.69	11.6	21.9	32.81	32.2	22.0	38.88	56.3
22.2	14.73	33.0	22.4	3.62	12.0	22.9	32.98	31.8	23.0	38.90	55.9
23.2	13.62	33.0	23.4	3.51	12.3	23.9	33.15	31.5	24.0	39.00	55.6
24.2	12.55	32.9	24.4	3.38	12.7	24.9	33.35	31.2	25.0	39.17	55.2
25.2	11.52	32.9	25.4	3.21	13.0	25.9	33.55	30.9	26.0	39.40	54.9
26.2	10.55	32.8	26.4	3.04	13.3	26.9	33.75	30.6	27.0	39.66	54.6
27.2	9.63	32.7	27.4	2.89	13.6	27.9	33.95	30.3	28.0	39.90	54.3
28.2	8.76	32.6	28.4	2.73	13.9	28.9	34.14	30.1	29.0	40.12	54.0
29.2	7.91	32.5	29.4	2.59	14.1	29.9	34.32	29.8	30.0	40.31	53.7
30.2	7.06	32.5	30.4	2.47	14.4	30.9	34.51	29.5	31.0	40.47	53.4
31.2	6.19	32.4	31.4	2.35	14.7	31.9	34.68	29.3	32.0	40.61	53.1
32.2	5.27	32.3	32.4	2.23	15.0	32.9	34.87	29.0			

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α* Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	*δ* Ursæ Minoris.		Mean Solar Date.	*λ* Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
Feb.	1 17	+88 43	Feb.	6 48	+87 13	Feb.	18 7	+86 36	Feb.	19 32	+88 57
	s	″		s	″		s	″		s	″
1.2	65.27	32.3	1.4	62.23	15.0	1.9	34.87	29.0	1.0	40.61	53.1
2.2	64.32	32.3	2.4	62.12	15.3	2.9	35.06	28.7	2.0	40.77	52.8
3.2	63.32	32.2	3.4	61.96	15.6	3.9	35.28	28.4	2.9	40.94	52.4
4.2	62.28	32.1	4.4	61.77	15.9	4.9	35.53	28.1	3.9	41.20	52.1
5.2	61.23	32.0	5.4	61.55	16.3	5.9	35.79	27.8	4.9	41.53	51.7
6.2	60.21	31.9	6.4	61.31	16.6	6.9	36.07	27.5	5.9	41.93	51.3
7.2	59.22	31.7	7.4	61.05	16.9	7.9	36.35	27.2	6.9	42.40	51.0
8.2	58.29	31.5	8.4	60.76	17.2	8.9	36.65	27.0	7.9	42.93	50.7
9.2	57.45	31.4	9.4	60.49	17.4	9.9	36.93	26.8	8.9	43.48	50.4
10.2	56.63	31.2	10.4	60.22	17.7	10.9	37.20	26.6	9.9	44.05	50.1
11.2	55.87	31.0	11.4	59.96	17.9	11.9	37.46	26.4	10.9	44.60	49.8
12.2	55.13	30.9	12.4	59.72	18.1	12.9	37.70	26.2	11.9	45.10	49.5
13.1	54.40	30.7	13.4	59.50	18.3	13.9	37.94	26.0	12.9	45.57	49.3
14.1	53.66	30.6	14.4	59.29	18.6	14.9	38.19	25.8	13.9	46.01	49.0
15.1	52.85	30.5	15.4	59.08	18.8	15.9	38.42	25.5	14.9	46.41	48.7
16.1	52.02	30.3	16.4	58.87	19.1	16.8	38.68	25.3	15.9	46.82	48.4
17.1	51.13	30.2	17.4	58.63	19.4	17.8	38.97	25.0	16.9	47.27	48.1
18.1	50.23	30.0	18.4	58.35	19.7	18.8	39.27	24.8	17.9	47.80	47.8
19.1	49.32	29.9	19.4	58.04	19.9	19.8	39.60	24.6	18.9	48.40	47.5
20.1	48.44	29.7	20.4	57.71	20.2	20.8	39.93	24.4	19.9	49.09	47.2
21.1	47.61	29.4	21.4	57.34	20.4	21.8	40.27	24.2	20.9	49.84	46.9
22.1	46.85	29.2	22.4	56.98	20.6	22.8	40.61	24.0	21.9	50.66	46.6
23.1	46.15	28.9	23.4	56.60	20.8	23.8	40.94	23.9	22.9	51.50	46.4
24.1	45.51	28.7	24.4	56.24	21.0	24.8	41.27	23.8	23.9	52.33	46.1
25.1	44.91	28.5	25.3	55.91	21.2	25.8	41.58	23.6	24.9	53.15	45.9
26.1	44.33	28.2	26.3	55.58	21.3	26.8	41.87	23.5	25.9	53.92	45.7
27.1	43.75	28.0	27.3	55.26	21.5	27.8	42.18	23.4	26.9	54.66	45.5
28.1	43.13	27.8	28.3	54.96	21.7	28.8	42.48	23.2	27.9	55.37	45.3
29.1	42.49	27.6	29.3	54.66	21.9	29.8	42.80	23.1	28.9	56.07	45.1
									29.9	56.80	44.8

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
Mar.	1 17	+88 43	Mar.	6 48	+87 13	Mar.	18 7	+86 36	Mar.	19 32	+88 57
	s	″		s	″		s	″		s	″
1.1	42.49	27.6	1.3	54.66	21.9	1.8	42.80	23.1	1.9	56.80	44.8
2.1	41.81	27.4	2.3	54.32	22.1	2.8	43.12	22.9	2.9	57.58	44.6
3.1	41.10	27.2	3.3	53.98	22.3	3.8	43.48	22.7	3.9	58.39	44.3
4.1	40.36	26.9	4.3	53.61	22.5	4.8	43.84	22.6	4.9	59.30	44.0
5.1	39.65	26.7	5.3	53.21	22.7	5.8	44.22	22.4	5.9	60.27	43.8
6.1	38.99	26.4	6.3	52.79	22.9	6.8	44.60	22.3	6.9	61.28	43.6
7.1	38.37	26.1	7.3	52.35	23.0	7.8	44.99	22.2	7.9	62.34	43.4
8.1	37.83	25.8	8.3	51.91	23.2	8.8	45.36	22.2	8.9	63.41	43.2
9.1	37.35	25.5	9.3	51.48	23.3	9.8	45.74	22.1	9.9	64.45	43.0
10.1	36.94	25.3	10.3	51.07	23.4	10.8	46.10	22.1	10.8	65.45	42.9
11.1	36.57	25.0	11.3	50.67	23.5	11.8	46.43	22.0	11.8	66.41	42.7
12.1	36.22	24.7	12.3	50.32	23.6	12.8	46.76	22.0	12.8	67.31	42.6
13.1	35.86	24.4	13.3	49.97	23.7	13.8	47.07	21.9	13.8	68.17	42.4
14.1	35.47	24.2	14.3	49.63	23.8	14.8	47.38	21.9	14.8	69.01	42.3
15.1	35.04	23.9	15.3	49.28	23.9	15.8	47.70	21.8	15.8	69.89	42.1
16.1	34.58	23.7	16.3	48.93	24.0	16.7	48.04	21.7	16.8	70.79	41.9
17.1	34.08	23.4	17.3	48.54	24.1	17.7	48.40	21.6	17.8	71.78	41.8
18.1	33.59	23.1	18.3	48.14	24.3	18.7	48.78	21.6	18.8	72.82	41.6
19.1	33.12	22.8	19.3	47.69	24.4	19.7	49.16	21.5	19.8	73.94	41.4
20.1	32.69	22.5	20.3	47.23	24.5	20.7	49.56	21.5	20.8	75.11	41.3
21.1	32.34	22.2	21.3	46.75	24.5	21.7	49.94	21.5	21.8	76.31	41.1
22.1	32.04	21.9	22.3	46.28	24.6	22.7	50.34	21.6	22.8	77.51	41.0
23.1	31.82	21.5	23.3	45.83	24.6	23.7	50.70	21.6	23.8	78.69	40.9
24.0	31.64	21.2	24.3	45.40	24.6	24.7	51.05	21.6	24.8	79.81	40.9
25.0	31.51	20.9	25.3	44.98	24.6	25.7	51.39	21.7	25.8	80.88	40.8
26.0	31.38	20.6	26.3	44.58	24.6	26.7	51.73	21.7	26.8	81.91	40.8
27.0	31.24	20.3	27.3	44.20	24.7	27.7	52.04	21.7	27.8	82.91	40.7
28.0	31.07	20.1	28.3	43.84	24.7	28.7	52.38	21.8	28.8	83.91	40.6
29.0	30.87	19.8	29.3	43.45	24.7	29.7	52.72	21.8	29.8	84.93	40.5
30.0	30.65	19.5	30.3	43.05	24.8	30.7	53.07	21.8	30.8	86.01	40.4
31.0	30.40	19.2	31.3	42.63	24.8	31.7	53.44	21.8	31.8	87.16	40.3
32.0	30.15	18.9	32.3	42.19	24.9	32.7	53.81	21.8	32.8	88.34	40.2

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
Apr.	h m 1 17	+88° 43′	Apr.	h m 6 48	+87° 13′	Apr.	h m 18 7	+86° 36′	Apr.	h m 19 33	+88° 57′
	s	″		s	″		s	″		s	″
1.0	30.15	18.9	1.3	42.19	24.9	1.7	53.81	21.8	1.8	28.34	40.2
2.0	29.95	18.6	2.3	41.72	24.9	2.7	54.21	21.9	2.8	29.58	40.1
3.0	29.79	18.2	3.2	41.26	24.9	3.7	54.58	21.9	3.8	30.85	40.0
4.0	29.70	17.9	4.2	40.78	24.9	4.7	54.96	22.0	4.8	32.12	40.0
5.0	29.70	17.5	5.2	40.32	24.8	5.7	55.33	22.2	5.8	33.36	40.0
6.0	29.76	17.2	6.2	39.86	24.8	6.7	55.68	22.3	6.8	34.57	40.0
7.0	29.87	16.9	7.2	39.45	24.7	7.7	56.01	22.4	7.8	35.70	40.0
8.0	30.00	16.6	8.2	39.06	24.7	8.7	56.31	22.5	8.8	36.79	40.0
9.0	30.14	16.3	9.2	38.69	24.6	9.7	56.61	22.7	9.8	37.82	40.1
10.0	30.27	16.0	10.2	38.34	24.5	10.7	56.90	22.8	10.8	38.79	40.1
11.0	30.34	15.7	11.2	37.99	24.5	11.7	57.18	22.9	11.8	39.78	40.1
12.0	30.40	15.5	12.2	37.64	24.4	12.7	57.48	23.0	12.8	40.79	40.1
13.0	30.42	15.2	13.2	37.28	24.4	13.7	57.80	23.0	13.8	41.84	40.0
14.0	30.42	14.9	14.2	36.89	24.3	14.7	58.12	23.1	14.8	42.94	40.0
15.0	30.44	14.6	15.2	36.48	24.3	15.7	58.46	23.2	15.8	44.12	40.0
16.0	30.50	14.3	16.2	36.04	24.3	16.7	58.80	23.4	16.7	45.32	40.0
17.0	30.61	14.0	17.2	35.59	24.2	17.7	59.13	23.5	17.7	46.56	40.1
18.0	30.79	13.7	18.2	35.16	24.1	18.7	59.46	23.7	18.7	47.80	40.1
19.0	31.04	13.3	19.2	34.71	24.0	19.7	59.79	23.9	19.7	49.02	40.2
20.0	31.36	13.0	20.2	34.30	23.8	20.7	60.09	24.1	20.7	50.17	40.3
21.0	31.70	12.7	21.2	33.93	23.6	21.7	60.36	24.3	21.7	51.28	40.4
22.0	32.09	12.4	22.2	33.57	23.5	22.7	60.62	24.5	22.7	52.32	40.5
23.0	32.45	12.1	23.2	33.23	23.3	23.7	60.87	24.7	23.7	53.32	40.6
24.0	32.78	11.9	24.2	32.92	23.2	24.7	61.12	24.9	24.7	54.27	40.7
25.0	33.10	11.6	25.2	32.60	23.1	25.7	61.39	25.1	25.7	55.24	40.7
26.0	33.36	11.4	26.2	32.27	23.0	26.7	61.65	25.2	26.7	56.23	40.8
27.0	33.61	11.1	27.2	31.93	22.9	27.7	61.93	25.4	27.7	57.28	40.9
28.0	33.85	10.9	28.2	31.57	22.7	28.7	62.22	25.5	28.7	58.37	40.9
28.9	34.10	10.5	29.2	31.19	22.6	29.7	62.52	25.7	29.7	59.49	41.0
29.9	34.40	10.3	30.2	30.80	22.5	30.6	62.81	25.9	30.7	60.64	41.1
30.9	34.77	10.0	31.2	30.42	22.3	31.6	63.10	26.2	31.7	61.81	41.2
31.9	35.22	9.6									

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
May	h m 1 17	+88° 43′	May	h m 6 48	+87° 13′	May	h m 18 8	+86° 36′	May	h m 19 34	+88° 57′
	s	″		s	″		s	″		s	″
1.9	35.22	9.6	1.2	30.42	22.3	1.6	3.10	26.2	1.7	1.81	41.2
2.9	35.72	9.3	2.2	30.03	22.1	2.6	3.37	26.4	2.7	2.94	41.4
3.9	36.28	9.1	3.2	29.66	21.9	3.6	3.62	26.7	3.7	4.04	41.5
4.9	36.88	8.8	4.2	29.33	21.7	4.6	3.85	27.0	4.7	5.05	41.7
5.9	37.48	8.6	5.2	29.02	21.5	5.6	4.05	27.2	5.7	6.01	41.9
6.9	38.08	8.4	6.2	28.75	21.3	6.6	4.24	27.5	6.7	6.88	42.1
7.9	38.64	8.2	7.2	28.51	21.1	7.6	4.43	27.7	7.7	7.70	42.2
8.9	39.16	8.0	8.2	28.27	20.9	8.6	4.59	27.9	8.7	8.48	42.4
9.9	39.64	7.8	9.1	28.03	20.7	9.6	4.77	28.2	9.7	9.28	42.5
10.9	40.09	7.6	10.1	27.79	20.5	10.6	4.96	28.4	10.7	10.11	42.7
11.9	40.54	7.3	11.1	27.54	20.4	11.6	5.16	28.6	11.7	10.99	42.8
12.9	41.02	7.1	12.1	27.25	20.2	12.6	5.38	28.8	12.7	11.89	43.0
13.9	41.55	6.8	13.1	26.96	20.0	13.6	5.58	29.1	13.7	12.85	43.1
14.9	42.12	6.6	14.1	26.66	19.8	14.6	5.80	29.3	14.7	13.84	43.3
15.9	42.77	6.3	15.1	26.34	19.6	15.6	6.00	29.6	15.7	14.83	43.5
16.9	43.48	6.1	16.1	26.05	19.3	16.6	6.19	29.9	16.7	15.79	43.7
17.9	44.24	5.9	17.1	25.77	19.1	17.6	6.35	30.2	17.7	16.71	43.9
18.9	45.03	5.7	18.1	25.53	18.8	18.6	6.50	30.5	18.7	17.54	44.2
29.9	45.81	5.5	19.1	25.31	18.5	19.6	6.64	30.8	19.7	18.30	44.4
20.9	46.57	5.3	20.1	25.12	18.2	20.6	6.76	31.1	20.7	19.01	44.6
21.9	47.28	5.2	21.1	24.94	18.0	21.6	6.87	31.4	21.7	19.69	44.9
22.9	47.94	5.0	22.1	24.80	17.7	22.6	6.97	31.7	22.6	20.32	45.1
23.9	48.59	4.9	23.1	24.64	17.5	23.6	7.09	31.9	23.6	20.97	45.3
24.9	49.19	4.7	24.1	24.45	17.3	24.6	7.20	32.2	24.6	21.65	45.5
25.9	49.82	4.5	25.1	24.26	17.0	25.6	7.33	32.5	25.6	22.38	45.7
26.9	50.46	4.3	26.1	24.06	16.8	26.6	7.47	32.7	26.6	23.14	45.9
27.9	51.17	4.1	27.1	23.83	16.6	27.6	7.62	33.0	27.6	23.96	46.1
28.9	51.93	3.9	28.1	23.62	16.3	28.6	7.75	33.3	28.6	24.72	46.3
29.9	52.77	3.7	29.1	23.40	16.1	29.6	7.88	33.6	29.6	25.50	46.6
30.9	53.67	3.6	30.1	23.21	15.8	30.6	7.98	34.0	30.6	26.24	46.9
31.9	54.58	3.4	31.1	23.04	15.5	31.6	8.06	34.3	31.6	26.90	47.2
32.9	55.48	3.3	32.1	22.90	15.1	32.6	8.11	34.6	32.6	27.49	47.4

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
June	h m 1 17	+88° 43′	June	h m 6 48	+87° 13′	June	h m 18 8	+86° 36′	June	h m 19 34	+88° 57′
	s	″		s	″		s	″		s	″
1.9	55.48	3.3	1.1	22.90	15.1	1.6	8.11	34.6	1.6	27.49	47.4
2.9	56.33	3.2	2.1	22.80	14.8	2.6	8.15	35.0	2.6	27.99	47.7
3.9	57.15	3.1	3.1	22.73	14.5	3.6	8.16	35.3	3.6	28.42	48.0
4.8	57.98	3.1	4.1	22.67	14.2	4.6	8.18	35.6	4.6	28.81	48.3
5.8	58.80	3.0	5.1	22.63	14.0	5.6	8.18	35.9	5.6	29.17	48.6
6.8	59.62	2.9	6.1	22.59	13.7	6.5	8.20	36.1	6.6	29.55	48.8
7.8	60.44	2.8	7.1	22.53	13.4	7.5	8.22	36.4	7.6	29.97	49.1
8.8	61.33	2.7	8.1	22.45	13.2	8.5	8.25	36.7	8.6	30.43	49.3
9.8	62.23	2.6	9.1	22.36	12.9	9.5	8.30	37.0	9.6	30.93	49.6
10.8	63.12	2.5	10.1	22.25	12.7	10.5	8.34	37.3	10.6	31.44	49.8
11.8	64.02	2.4	11.1	22.14	12.4	11.5	8.38	37.6	11.6	31.96	50.1
12.8	64.91	2.2	12.1	22.04	12.1	12.5	8.40	37.9	12.6	32.48	50.4
13.8	65.81	2.2	13.1	21.96	11.8	13.5	8.41	38.3	13.6	32.94	50.7
14.8	66.70	2.1	14.1	21.90	11.4	14.5	8.39	38.7	14.6	33.33	51.1
15.8	67.59	2.0	15.1	21.87	11.1	15.5	8.35	39.0	15.6	33.65	51.4
16.8	68.49	2.0	16.0	21.88	10.7	16.5	8.30	39.3	16.6	33.90	51.7
17.8	69.38	2.0	17.0	21.91	10.4	17.5	8.23	39.7	17.6	34.09	52.1
18.8	70.31	2.0	18.0	21.96	10.1	18.5	8.17	40.0	18.6	34.25	52.4
19.8	71.25	1.9	19.0	22.00	9.8	19.5	8.11	40.2	19.6	34.39	52.6
20.8	72.19	1.9	20.0	22.04	9.5	20.5	8.05	40.5	20.6	34.56	52.9
21.8	73.13	1.9	21.0	22.05	9.3	21.5	8.01	40.8	21.6	34.76	53.2
22.8	74.07	1.9	22.0	22.07	9.0	22.5	7.97	41.1	22.6	35.01	53.4
23.8	75.01	1.8	23.0	22.06	8.7	23.5	7.93	41.3	23.6	35.29	53.7
24.8	75.95	1.7	24.0	22.04	8.4	24.5	7.89	41.7	24.6	35.57	54.0
25.8	76.89	1.7	25.0	22.02	8.1	25.5	7.85	42.0	25.6	35.85	54.3
26.8	77.83	1.7	26.0	22.04	7.8	26.5	7.77	42.3	26.6	36.08	54.7
27.8	78.77	1.7	27.0	22.06	7.5	27.5	7.69	42.7	27.6	36.25	55.0
28.8	79.72	1.7	28.0	22.12	7.1	28.5	7.58	43.0	28.5	36.34	55.4
29.8	80.68	1.7	29.0	22.21	6.8	29.5	7.44	43.4	29.5	36.35	55.7
30.8	81.64	1.8	30.0	22.34	6.5	30.5	7.29	43.7	30.5	36.28	56.1
31.8	82.60	1.8	31.0	22.49	6.1	31.5	7.13	44.0	31.5	36.15	56.4

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*a* Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (HEV.)		Mean Solar Date.	*δ* Ursæ Minoris.		Mean Solar Date.	*λ* Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
July	$1^{h}\ 18^{m}$	$+88^{\circ}\ 43'$	July	$6^{h}\ 48^{m}$	$+87^{\circ}\ 12'$	July	$18^{h}\ 8^{m}$	$+86^{\circ}\ 36'$	July	$19^{h}\ 34^{m}$	$+88^{\circ}\ 57'$
	s	″		s	″		s	″		s	″
1.8	22.60	1.8	1.0	22.49	66.1	1.5	7.13	44.0	1.5	36.15	56.4
2.8	23.56	1.9	2.0	22.64	65.8	2.5	6.96	44.3	2.5	35.99	56.8
3.8	24.52	2.0	3.0	22.81	65.5	3.5	6.79	44.5	3.5	35.82	57.1
4.8	25.48	2.1	4.0	22.98	65.3	4.5	6.64	44.8	4.5	35.67	57.4
5.8	26.44	2.1	5.0	23.11	65.0	5.5	6.49	45.1	5.5	35.58	57.6
6.8	27.40	2.2	6.0	23.24	64.7	6.5	6.37	45.3	6.5	35.53	57.9
7.8	28.36	2.2	7.0	23.35	64.5	7.5	6.25	45.6	7.5	35.49	58.2
8.8	29.32	2.2	8.0	23.44	64.2	8.5	6.10	45.9	8.5	35.48	58.6
9.8	30.27	2.3	9.0	23.55	63.9	9.5	5.96	46.2	9.5	35.45	58.9
10.8	31.23	2.3	10.0	23.66	63.5	10.5	5.80	46.5	10.5	35.39	59.2
11.7	32.18	2.4	11.0	23.80	63.2	11.5	5.63	46.9	11.6	35.25	59.6
12.7	33.14	2.5	12.0	23.97	62.9	12.4	5.44	47.2	12.5	35.06	60.0
13.7	34.10	2.6	13.0	24.18	62.5	13.4	5.22	47.5	13.5	34.82	60.3
14.7	35.05	2.7	14.0	24.41	62.2	14.4	5.00	47.8	14.5	34.43	60.7
15.7	36.01	2.8	15.0	24.66	61.9	15.4	4.76	48.1	15.5	34.05	61.0
16.7	36.96	3.0	16.0	24.90	61.6	16.4	4.53	48.3	16.5	33.64	61.3
17.7	37.92	3.1	17.0	25.16	61.4	17.4	4.31	48.6	17.5	33.24	61.6
18.7	38.85	3.2	18.0	25.40	61.1	18.4	4.09	48.8	18.5	32.88	61.9
19.7	39.78	3.3	19.0	25.62	60.8	19.4	3.89	49.0	19.5	32.56	62.2
20.7	40.71	3.4	20.0	25.82	60.6	20.4	3.68	49.3	20.5	32.26	62.5
21.7	41.64	3.5	20.9	26.01	60.3	21.4	3.49	49.5	21.5	31.99	62.7
22.7	42.57	3.6	21.9	26.19	60.1	22.4	3.28	49.8	22.5	31.72	63.1
23.7	43.51	3.7	22.9	26.39	59.8	23.4	3.09	50.1	23.5	31.43	63.4
24.7	44.44	3.9	23.9	26.61	59.5	24.4	2.86	50.4	24.5	31.08	63.7
25.7	45.37	4.0	24.9	26.85	59.2	25.4	2.60	50.6	25.5	30.65	64.1
26.7	46.30	4.2	25.9	27.13	58.8	26.4	2.31	50.9	26.5	30.15	64.4
27.7	47.23	4.4	26.9	27.43	58.5	27.4	2.00	51.2	27.5	29.57	64.8
28.7	48.12	4.6	27.9	27.77	58.2	28.4	1.69	51.5	28.5	28.91	65.1
29.7	49.00	4.8	28.9	28.12	57.9	29.4	1.36	51.7	29.5	28.21	65.5
30.7	49.89	5.0	29.9	28.48	57.7	30.4	1.04	51.9	30.5	27.49	65.8
31.7	50.77	5.2	30.9	28.83	57.4	31.4	0.73	52.1	31.5	26.79	66.0
32.7	51.66	5.4	31.9	29.17	57.2	32.4	0.43	52.3	32.5	26.15	66.3
			32.9	29.50	57.0						

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
Aug.	h m 1 18	° ′ +88 43	Aug.	h m 6 48	° ′ +87 12	Aug.	h m 18 7	° ′ +86 36	Aug.	h m 19 33	° ′ +88 58
	s	″		s	″		s	″		s	″
1.7	51.66	5.4	1.9	29.50	57.0	1.4	60.43	52.3	1.5	86.15	6.3
2.7	52.50	5.6	2.9	29.79	56.8	2.4	60.16	52.5	2.5	85.52	6.6
3.7	53.29	5.8	3.9	30.08	56.5	3.4	59.88	52.7	3.5	84.95	6.9
4.7	54.12	6.0	4.9	30.36	56.3	4.4	59.61	52.9	4.4	84.39	7.2
5.7	54.99	6.1	5.9	30.65	56.0	5.4	59.33	53.1	5.4	83.84	7.4
6.7	55.92	6.3	6.9	30.96	55.7	6.4	59.04	53.4	6.4	83.27	7.8
7.7	56.86	6.5	7.9	31.31	55.5	7.4	58.73	53.6	7.4	82.65	8.1
8.7	57.83	6.7	8.9	31.67	55.2	8.4	58.40	53.9	8.4	81.94	8.4
9.7	58.77	7.0	9.9	32.07	54.9	9.4	58.06	54.1	9.4	81.18	8.8
10.7	59.67	7.2	10.9	32.47	54.6	10.4	57.70	54.3	10.4	80.34	9.1
11.7	60.53	7.5	11.9	32.89	54.4	11.4	57.34	54.5	11.4	79.45	9.4
13.7	61.30	7.8	12.9	33.33	54.2	12.4	56.98	54.7	12.4	78.53	9.7
13.7	62.04	8.0	13.9	33.73	54.0	13.4	56.62	54.9	13.4	77.63	9.9
14.7	62.72	8.3	14.9	34.12	53.8	14.4	56.27	55.0	14.4	76.74	10.2
15.7	63.39	8.5	15.9	34.49	53.6	15.4	55.94	55.1	15.4	75.90	10.4
16.6	64.07	8.8	16.9	34.85	53.4	16.4	55.61	55.3	16.4	75.10	10.7
17.6	64.78	9.0	17.9	35.20	53.2	17.4	55.30	55.4	17.4	74.34	10.9
18.6	65.51	9.2	18.9	35.55	53.0	18.3	54.96	55.6	18.4	73.59	11.2
19.6	66.32	9.5	19.9	35.92	52.8	19.3	54.63	55.8	19.4	72.82	11.5
20.6	67.15	9.7	20.9	36.31	52.6	20.3	54.28	56.0	20.4	72.00	11.7
21.6	68.01	9.9	21.9	36.73	52.3	21.3	53.93	56.2	21.4	71.13	12.0
22.6	68.87	10.2	22.9	37.18	52.1	22.3	53.53	56.4	22.4	70.19	12.3
23.6	69.69	10.5	23.9	37.65	51.9	23.3	53.13	56.5	23.4	69.15	12.6
24.6	70.49	10.9	24.9	38.15	51.6	24.3	52.71	56.7	24.4	68.06	12.9
25.6	71.20	11.2	25.8	38.66	51.5	25.3	52.28	56.8	25.4	66.92	13.2
26.6	71.87	11.5	26.8	39.15	51.3	26.3	51.85	56.9	26.4	65.74	13.4
27.6	72.48	11.9	27.8	39.64	51.1	27.3	51.44	57.0	27.4	64.59	13.7
28.6	73.04	12.2	28.8	40.11	51.0	28.3	51.04	57.1	28.4	63.45	13.9
29.6	73.58	12.5	29.8	40.55	50.9	29.3	50.66	57.2	29.4	62.39	14.1
30.6	74.13	12.8	30.8	40.98	50.7	30.3	50.29	57.3	30.4	61.36	14.3
31.6	74.72	13.0	31.8	41.39	50.6	31.3	49.92	57.4	31.4	60.36	14.5
32.6	75.34	13.3	32.8	41.82	50.4	32.3	49.55	57.5	32.4	59.38	14.7

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
Sept.	$1^{h}\ 19^{m}$	$+88^{\circ}\ 43'$	Sept.	$6^{h}\ 48^{m}$	$+87^{\circ}\ 12'$	Sept.	$18^{h}\ 7^{m}$	$+86^{\circ}\ 36'$	Sept.	$19^{h}\ 33^{m}$	$+88^{\circ}\ 58'$
	s	″		s	″		s	″		s	″
1.6	15.34	13.3	1.8	41.82	50.4	1.3	49.55	57.5	1.4	59.38	14.7
2.6	16.01	13.6	2.8	42.23	50.2	2.3	49.17	57.6	2.4	58.40	15.0
3.6	16.71	13.9	3.8	42.69	50.0	3.3	48.79	57.8	3.4	57.38	15.2
4.6	17.42	14.2	4.8	43.17	49.8	4.3	48.38	57.9	4.4	56.29	15.5
5.6	18.13	14.6	5.8	43.69	49.6	5.3	47.96	58.1	5.4	55.14	15.7
6.6	18.80	14.9	6.8	44.22	49.5	6.3	47.51	58.2	6.4	53.92	16.0
7.6	19.40	15.3	7.8	44.76	49.3	7.3	47.08	58.3	7.4	52.66	16.2
8.6	19.96	15.6	8.8	45.29	49.2	8.3	46.63	58.3	8.4	51.35	16.4
9.6	20.43	16.0	9.8	45.83	49.1	9.3	46.20	58.4	9.4	50.04	16.6
10.6	20.88	16.4	10.8	46.35	49.0	10.3	45.77	58.4	10.3	48.75	16.8
11.6	21.27	16.7	11.8	46.84	48.9	11.3	45.36	58.4	11.3	47.53	16.9
12.6	21.65	17.0	12.8	47.31	48.8	12.3	44.96	58.4	12.3	46.32	17.1
13.6	22.06	17.3	13.8	47.76	48.7	13.3	44.57	58.5	13.3	45.18	17.2
14.6	22.50	17.7	14.8	48.21	48.6	14.3	44.18	58.5	14.3	44.05	17.4
15.6	23.00	18.0	15.8	48.67	48.5	15.3	43.79	58.6	15.3	42.94	17.6
16.6	23.52	18.3	16.8	49.14	48.4	16.3	43.39	58.6	16.3	41.80	17.8
17.6	24.07	18.6	17.8	49.64	48.3	17.3	42.97	58.7	17.3	40.61	18.0
18.6	24.64	19.0	18.8	50.16	48.1	18.3	42.52	58.8	18.3	39.34	18.2
19.6	25.18	19.4	19.8	50.72	48.0	19.3	42.08	58.8	19.3	38.02	18.4
20.6	25.69	19.7	20.8	51.29	47.9	20.3	41.61	58.9	20.3	36.64	18.5
21.6	26.13	20.1	21.8	51.88	47.8	21.3	41.14	58.9	21.3	35.19	18.7
22.5	26.50	20.5	22.8	52.46	47.8	22.3	40.66	58.9	22.3	33.71	18.9
23.5	26.79	20.9	23.8	53.03	47.7	23.3	40.20	58.8	23.3	32.22	19.0
24.5	27.05	21.3	24.8	53.58	47.7	24.2	39.74	58.8	24.3	30.79	19.1
25.5	27.27	21.7	25.8	54.11	47.7	25.2	39.31	58.7	25.3	29.41	19.2
26.5	27.48	22.1	26.8	54.63	47.6	26.2	38.90	58.7	26.3	28.06	19.3
27.5	27.72	22.4	27.8	55.10	47.6	27.2	38.50	58.7	27.3	26.76	19.4
28.5	27.99	22.8	28.8	55.59	47.6	28.2	38.10	58.6	28.3	25.50	19.5
29.5	28.30	23.1	29.8	56.08	47.5	29.2	37.69	58.6	29.3	24.25	19.6
30.5	28.64	23.5	30.8	56.59	47.4	30.2	37.27	58.6	30.3	22.99	19.8
31.5	29.00	23.8	31.8	57.12	47.4	31.2	36.85	58.6	31.3	21.68	19.9

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
Oct.	h m 1 19	° ′ +88 43	Oct.	h m 6 48	° ′ +87 12	Oct.	h m 18 7	° ′ +86 36	Oct.	h m 19 32	° ′ +88 58
	s	″		s	″		s	″		s	″
1.5	29.00	23.8	1.8	57.12	47.4	1.2	36.85	58.6	1.3	81.68	19.9
2.5	29.35	24.2	2.7	57.66	47.3	2.2	36.41	58.6	2.3	80.31	20.0
3.5	29.68	24.6	3.7	58.24	47.2	3.2	35.97	58.6	3.3	78.88	20.2
4.5	29.97	25.0	4.7	58.83	47.2	4.2	35.51	58.6	4.3	77.40	20.3
5.5	30.19	25.5	5.7	59.42	47.2	5.2	35.06	58.5	5.3	75.88	20.4
6.5	30.32	25.9	6.7	60.01	47.2	6.2	34.61	58.5	6.3	74.35	20.5
7.5	30.42	26.3	7.7	60.57	47.2	7.2	34.16	58.4	7.3	72.85	20.5
8.5	30.45	26.7	8.7	61.10	47.3	8.2	33.74	58.2	8.3	71.40	20.6
9.5	30.48	27.0	9.7	61.61	47.3	9.2	33.33	58.1	9.3	69.99	20.6
10.5	30.49	27.4	10.7	62.11	47.4	10.2	32.93	58.0	10.3	68.65	20.7
11.5	30.56	27.8	11.7	62.59	47.4	11.2	32.55	57.9	11.3	67.35	20.7
12.5	30.63	28.1	12.7	63.07	47.4	12.2	32.17	57.8	12.3	66.07	20.7
13.5	30.77	28.5	13.7	63.57	47.4	13.2	31.77	57.8	13.3	64.78	20.8
14.5	30.92	28.8	14.7	64.08	47.4	14.2	31.38	57.7	14.3	63.46	20.8
15.5	31.10	29.2	15.7	64.62	47.4	15.2	30.96	57.6	15.3	62.09	20.9
16.5	31.25	29.6	16.7	65.16	47.4	16.2	30.52	57.5	16.2	60.66	21.0
17.5	31.39	30.0	17.7	65.74	47.4	17.2	30.07	57.5	17.2	59.15	21.0
18.5	31.46	30.4	18.7	66.32	47.5	18.2	29.60	57.4	18.2	57.61	21.1
19.5	31.46	30.9	19.7	66.91	47.5	19.2	29.13	57.2	19.2	56.02	21.1
20.5	31.38	31.3	20.7	67.49	47.6	20.2	28.67	57.1	20.2	54.43	21.1
21.5	31.26	31.7	21.7	68.05	47.7	21.2	28.22	56.9	21.2	52.88	21.1
22.5	31.09	32.1	22.7	68.61	47.8	22.2	27.79	56.7	22.2	51.36	21.1
23.5	30.91	32.5	23.7	69.11	47.9	23.2	27.39	56.5	23.2	49.93	21.0
24.5	30.73	32.8	24.7	69.60	48.0	24.2	27.01	56.3	24.2	48.56	21.0
25.5	30.59	33.2	25.7	70.09	48.1	25.2	26.62	56.2	25.2	47.21	20.9
26.5	30.46	33.5	26.7	70.54	48.2	26.2	26.25	56.0	26.2	45.90	20.9
27.5	30.39	33.9	27.7	71.00	48.3	27.2	25.89	55.9	27.2	44.59	20.9
28.5	30.33	34.2	28.7	71.48	48.3	28.2	25.55	55.8	28.2	43.25	20.9
29 4	30.30	34.6	29.7	71.99	48.4	29.2	25.18	55.6	29.2	41.87	20.9
30.4	30.23	35.0	30.7	72.53	48.5	30.2	24.82	55.5	30.2	40.46	20.9
31.4	30.11	35.4	31.7	73.09	48.6	31.2	24.43	55.3	31.2	38.97	20.9
32.4	29.94	35.8	32.7	73.71	48.7	32.1	24.05	55.1	32.2	37.47	20.9

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
Nov.	1 19	+88 43	Nov.	6 49	+87 12	Nov.	18 7	+86 36	Nov.	19 31	+88 56
	s	″		s	″		s	″		s	″
1.4	29.94	35.8	1.7	13.71	48.7	1.1	24.05	55.1	1.2	97.47	20.9
2.4	29.71	36.2	2.7	14.26	48.8	2.1	23.67	54.9	2.2	95.95	20.8
3.4	29.41	36.6	3.7	14.80	49.0	3.1	23.30	54.7	3.2	94.44	20.7
4.4	29.05	37.0	4.7	15.30	49.1	4.1	22.95	54.5	4.2	92.99	20.6
5.4	28.65	37.4	5.7	15.78	49.3	5.1	22.64	54.2	5.2	91.60	20.5
6.4	28.26	37.7	6.7	16.22	49.5	6.1	22.31	54.0	6.2	90.25	20.4
7.4	27.87	38.0	7.7	16.66	49.6	7.1	21.99	53.7	7.2	89.00	20.3
8.4	27.53	38.4	8.6	17.07	49.8	8.1	21.68	53.5	8.2	87.76	20.2
9.4	27.24	38.7	9.6	17.50	49.9	9.1	21.38	53.3	9.2	86.54	20.1
10.4	26.96	39.0	10.6	17.94	50.1	10.1	21.06	53.1	10.2	85.32	20.0
11.4	26.70	39.3	11.6	18.40	50.2	11.1	20.74	52.9	11.2	84.06	19.9
12.4	26.45	39.7	12.6	18.87	50.3	12.1	20.39	52.7	12.2	82.75	19.9
13.4	26.17	40.1	13.6	19.38	50.4	13.1	20.04	52.5	13.2	81.40	19.8
14.4	25.85	40.4	14.6	19.89	50.6	14.1	19.70	52.3	14.2	79.97	19.7
15.4	25.45	40.8	15.6	20.41	50.8	15.1	19.34	52.0	15.2	78.52	19.6
16.4	25.00	41.2	16.6	20.92	51.0	16.1	19.00	51.8	16.2	77.07	19.4
17.4	24.46	41.6	17.6	21.40	51.2	17.1	18.66	51.5	17.2	75.63	19.3
18.4	23.89	41.9	18.6	21.85	51.5	18.1	18.34	51.2	18.2	74.26	19.1
19.4	23.30	42.3	19.6	22.27	51.7	19.1	18.05	50.9	19.2	72.96	18.9
20.4	22.69	42.6	20.6	22.67	51.9	20.1	17.80	50.6	20.2	71.74	18.8
21.4	22.11	42.9	21.6	23.05	52.2	21.1	17.53	50.3	21.1	70.56	18.6
22.4	21.57	43.2	22.6	23.42	52.4	22.1	17.29	50.0	22.1	69.44	18.4
23.4	21.05	43.5	23.6	23.79	52.6	23.1	17.06	49.7	23.1	68.34	18.2
24.4	20.59	43.8	24.6	24.17	52.8	24.1	16.81	49.5	24.1	67.24	18.1
25.4	20.12	44.1	25.6	24.57	52.9	25.1	16.56	49.2	25.1	66.10	18.0
26.4	19.66	44.4	26.6	24.99	53.1	26.1	16.30	49.0	26.1	64.92	17.8
27.4	19.15	44.7	27.6	25.43	53.3	27.1	16.02	48.7	27.1	63.73	17.7
28.4	18.59	45.0	28.6	25.86	53.6	28.1	15.77	48.4	28.1	62.46	17.5
29.4	17.98	45.3	29.6	26.27	53.8	29.1	15.50	48.1	29.1	61.21	17.3
30.4	17.29	45.7	30.6	26.69	54.1	30.1	15.24	47.8	30.1	59.97	17.1
31.4	16.55	46.0	31.6	27.06	54.4	31.1	15.01	47.5	31.1	58.78	16.8

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
Dec.	1 18	+88 43	Dec.	6 49	+87 12	Dec.	18 7	+86 36	Dec.	19 31	+88 58
	s	″		s	″		s	″		s	″
1.4	76.55	46.0	1.6	27.06	54.4	1.1	15.01	47.5	1.1	58.78	16.8
2.4	75.76	46.3	2.6	27.41	54.7	2.1	14.80	47.1	2.1	57.64	16.6
3.4	74.96	46.5	3.6	27.73	55.0	3.1	14.63	46.8	3.1	56.59	16.3
4.3	74.18	46.8	4.6	28.02	55.2	4.1	14.43	46.4	4.1	55.61	16.1
5.3	73.41	47.0	5.6	28.29	55.5	5.0	14.27	46.1	5.1	54.69	15.8
6.3	72.71	47.2	6.6	28.57	55.8	6.0	14.11	45.8	6.1	53.79	15.6
7.3	72.03	47.4	7.6	28.85	56.0	7.0	13.96	45.5	7.1	52.92	15.4
8.3	71.41	47.7	8.6	29.15	56.3	8.0	13.79	45.2	8.1	52.01	15.2
9.3	70.77	47.9	9.6	29.45	56.5	9.0	13.61	44.9	9.1	51.07	15.0
10.3	70.13	48.2	10.6	29.79	56.7	10.0	13.43	44.6	10.1	50.10	14.8
11.3	69.45	48.4	11.6	30.13	57.0	11.0	13.23	44.3	11.1	49.07	14.6
12.3	68.72	48.7	12.6	30.47	57.3	12.0	13.04	44.0	12.1	48.01	14.3
13.3	67.93	49.0	13.6	30.81	57.6	13.0	12.85	43.7	13.1	46.97	14.1
14.3	67.07	49.2	14.5	31.13	57.9	14.0	12.66	43.3	14.1	45.92	13.8
15.3	66.15	49.5	15.5	31.41	58.2	15.0	12.51	42.9	15.1	44.93	13.5
16.3	65.21	49.7	16.5	31.66	58.6	16.0	12.40	42.5	16.1	44.03	13.2
17.3	64.26	49.9	17.5	31.88	58.9	17.0	12.28	42.2	17.1	43.20	12.9
18.3	63.33	50.1	18.5	32.08	59.2	18.0	12.20	41.8	18.1	42.45	12.6
19.3	62.45	50.3	19.5	32.25	59.5	19.0	12.13	41.5	19.1	41.77	12.3
20.3	61.60	50.4	20.5	32.42	59.8	20.0	12.06	41.1	20.1	41.12	12.0
21.3	60.78	50.6	21.5	32.60	60.1	21.0	12.00	40.8	21.1	40.49	11.8
22.3	59.99	50.7	22.5	32.80	60.4	22.0	11.93	40.5	22.1	39.84	11.5
23.3	59.23	50.9	23.5	33.01	60.6	23.0	11.84	40.2	23.1	39.17	11.3
24.3	58.43	51.1	24.5	33.24	60.9	24.0	11.76	39.9	24.1	38.44	11.0
25.3	57.60	51.3	25.5	33.47	61.2	25.0	11.68	39.6	25.1	37.70	10.7
26.3	56.72	51.5	26.5	33.68	61.5	26.0	11.60	39.2	26.1	36.95	10.5
27.3	55.77	51.6	27.5	33.89	61.9	27.0	11.52	38.8	27.1	36.21	10.1
28.3	54.77	51.8	28.5	34.08	62.2	28.0	11.47	38.5	28.1	35.51	9.8
29.3	53.72	52.0	29.5	34.22	62.6	29.0	11.44	38.1	29.1	34.87	9.5
30.3	52.66	52.1	30.5	34.33	63.0	30.0	11.42	37.7	30.1	34.33	9.1
31.3	51.61	52.2	31.5	34.41	63.3	31.0	11.43	37.3	31.1	33.85	8.8
32.3	50.58	52.3	32.5	34.48	63.7	32.0	11.46	36.9	32.1	33.46	8.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Andromedæ.		γ Pegasi. (*Algenib.*)		β Hydri.		12 Ceti.	
	Right Ascension.	Declination *North*.	Right Ascension.	Declination *North*.	Right Ascension.	Declination *South*.	Right Ascension.	Declination *South*.
	h m 0 2	° ′ +28 28	h m 0 7	° ′ +14 34	h m 0 19	° ′ −77 52	h m 0 24	° ′ − 4 33
	s	″	s	″	s	″	s	″
(Dec.30.2)	40.89 −.14	60.8 −0.8	33.10 −.12	16.1 −0.7	56.00 −.90	52.8 +0.7	24.39 −.11	64.2 −0.7
Jan. 9.2	40.75 .14	59.9 1.1	32.98 .11	15.3 0.9	55.12 .85	51.7 1.3	24.28 .11	64.8 0.6
19.2	40.62 .13	58.7 1.3	32.87 .10	14.3 1.0	54.31 .78	50.1 1.9	24.17 .10	65.3 0.5
29.1	40.49 .11	57.3 1.5	32.77 .09	13.3 1.0	53.57 .68	47.9 2.4	24.07 .09	65.7 0.3
Feb. 8.1	40.39 .09	55.8 1.6	32.68 .07	12.3 1.0	52.94 .57	45.2 2.9	23.99 .08	66.0 −0.2
18.1	40.31 −.06	54.1 −1.6	32.62 −.05	11.3 −1.0	52.42 −.45	42.2 +3.2	23.92 −.06	66.1 0.0
28.1	40.27 −.03	52.5 1.6	32.58 −.02	10.3 0.9	52.04 .31	38.8 3.5	23.87 −.03	65.9 +0.2
Mar.10.0	40.25 +.01	51.0 1.5	32.57 +.01	9.5 0.7	51.81 −.16	35.1 3.7	23.85 .00	65.6 0.4
20.0	40.28 .05	49.6 1.3	32.60 .05	8.9 0.5	51.73 .00	31.4 3.8	23.87 +.03	65.1 0.7
30.0	40.36 .10	48.4 1.0	32.67 .09	8.5 −0.2	51.81 +.16	27.5 3.8	23.92 .07	64.3 0.9
Apr. 9.0	40.48 +.15	47.5 −0.7	32.78 +.13	8.4 0.0	52.04 +.31	23.7 +3.8	24.01 +.11	63.3 +1.1
19.0	40.65 .19	46.9 −0.4	32.93 .17	8.6 +0.3	52.43 .47	19.9 3.7	24.14 .15	62.0 1.4
28.9	40.86 .23	46.7 0.0	33.13 .21	9.1 0.7	52.97 .61	16.3 3.5	24.32 .19	60.5 1.6
May 8.9	41.11 .27	46.9 +0.4	33.36 .25	9.9 1.0	53.66 .75	13.0 3.2	24.53 .23	58.8 1.8
18.9	41.40 .30	47.4 0.8	33.62 .28	11.0 1.3	54.47 .87	10.0 2.8	24.77 .26	57.0 1.9
28.8	41.71 +.32	48.4 +1.1	33.91 +.30	12.5 +1.5	55.39 +.97	7.3 +2.4	25.04 +.28	55.0 +2.0
June 7.8	42.04 .34	49.7 1.5	34.22 .31	14.1 1.8	56.40 1.05	5.2 1.9	25.34 .30	52.9 2.1
17.8	42.38 .34	51.3 1.8	34.54 .32	16.0 1.9	57.49 1.10	3.4 1.4	25.65 .31	50.8 2.1
27.7	42.72 .34	53.3 2.0	34.86 .32	18.0 2.1	58.61 1.13	2.3 0.9	25.97 .32	48.7 2.1
July 7.7	43.06 .33	55.4 2.2	35.18 .31	20.1 2.1	59.75 1.13	1.7 +0.3	26.28 .31	46.7 2.0
17.7	43.38 +.31	57.8 +2.4	35.48 +.29	22.3 +2.2	60.87+1.09	1.7 −0.3	26.59 +.30	44.8 +1.8
27.7	43.67 .28	60.2 2.5	35.76 .27	24.5 2.1	61.94 1.03	2.2 0.8	26.88 .28	43.1 1.6
Aug. 6.6	43.93 .25	62.8 2.5	36.02 .24	26.6 2.1	62.93 .94	3.3 1.3	27.14 .25	41.6 1.4
16.6	44.16 .21	65.3 2.5	36.24 .20	28.6 2.0	63.81 .81	4.9 1.8	27.38 .22	40.4 1.1
26.6	44.35 .17	67.8 2.4	36.42 .17	30.5 1.8	64.55 .67	7.0 2.3	27.58 .18	39.4 0.8
Sept. 5.6	44.50 +.13	70.1 +2.3	36.57 +.13	32.1 +1.6	65.14 +.52	9.4 −2.6	27.74 +.15	38.7 +0.6
15.5	44.61 .09	72.4 2.2	36.68 .09	33.7 1.4	65.55 .32	12.2 2.9	27.87 .11	38.3 +0.3
25.5	44.67 .05	74.5 2.0	36.76 .06	35.0 1.2	65.77 +.13	15.2 3.0	27.96 .07	38.1 0.0
Oct. 5.5	44.70 +.01	76.4 1.8	36.79 +.02	36.1 1.0	65.81 −.06	18.2 3.0	28.02 .04	38.2 −0.2
15.5	44.70 −.02	78.0 1.5	36.80 −.01	37.0 0.8	65.65 .24	21.2 2.9	28.04 +.01	38.5 0.4
25.4	44.66 −.05	79.4 +1.2	36.78 −.04	37.6 +0.5	65.32 −.42	24.1 −2.7	28.03 −.02	38.9 −0.5
Nov. 4.4	44.60 .07	80.5 1.0	36.73 .06	38.0 0.3	64.82 .57	26.7 2.4	28.00 .04	39.5 0.6
14.4	44.51 .10	81.3 0.7	36.66 .08	38.2 +0.1	64.18 .70	28.8 2.0	27.95 .06	40.2 0.7
24.3	44.40 .12	81.8 +0.4	36.57 .09	38.2 −0.1	63.43 .80	30.6 1.5	27.88 .08	40.9 0.7
Dec. 4.3	44.28 .13	82.0 0.0	36.47 .10	38.0 0.3	62.59 .87	31.8 0.9	27.79 .09	41.7 0.8
14.3	44.15 −.13	81.9 −0.3	36.36 −.11	37.6 −0.5	61.70 −.90	32.3 −0.3	27.69 −.10	42.5 −0.7
24.3	44.01 .14	81.5 0.6	36.25 .11	37.0 0.7	60.79 .90	32.2 +0.3	27.59 .10	43.2 0.7
34.2	43.87 −.14	80.7 −0.9	36.14 −.12	36.3 −0.8	59.89 −.88	31.5 +1.0	27.48 −.11	43.8 −0.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α* Cassiopeæ.		*β* Ceti.		21 Cassiopeæ.		*ε* Piscium.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	$0^h\ 34^m$	$+55°\ 55'$	$0^h\ 38^m$	$-18°\ 35'$	$0^h\ 38^m$	$+74°\ 22'$	$0^h\ 57^m$	$+\ 7°\ 17'$
	s	″	s	″	s	″	s	″
(Dec. 30.3)	15.00 −.29	71.4 −0.1	3.08 −.12	40.7 −0.6	22.20 −.71	84.6 +0.3	13.13 −.11	46.4 −0.6
Jan. 9.2	14.70 .29	71.0 0.7	2.96 .12	41.1 0.3	21.47 .73	84.6 −0.3	13.01 .12	45.7 0.7
19.2	14.41 .28	70.1 1.2	2.84 .12	41.4 −0.1	20.74 .71	84.0 0.9	12.90 .12	45.0 0.7
29.2	14.13 .27	68.7 1.6	2.73 .11	41.3 +0.2	20.05 .66	82.8 1.5	12.78 .11	44.4 0.7
Feb. 8.1	13.88 .24	66.9 1.9	2.63 .09	41.0 0.5	19.41 .59	81.0 2.0	12.67 .10	43.7 0.6
18.1	13.66 −.19	64.8 −2.2	2.54 −.07	40.4 +0.7	18.86 −.49	78.9 −2.4	12.57 −.09	43.2 −0.5
28.1	13.49 .14	62.5 2.4	2.48 .05	39.6 1.0	18.43 .38	76.3 2.7	12.49 .06	42.7 0.4
Mar. 10.1	13.38 .06	60.0 2.5	2.44 −.02	38.4 1.3	18.11 .24	73.5 2.9	12.44 −.03	42.4 −0.2
20.0	13.34 −.01	57.5 2.5	2.44 +.02	37.1 1.5	17.95 −.09	70.6 3.0	12.43 .00	42.2 0.0
30.0	13.37 +.07	55.0 2.4	2.48 .06	35.5 1.7	17.93 +.06	67.6 2.9	12.44 +.04	42.3 +0.2
Apr. 9.0	13.48 +.14	52.7 −2.1	2.56 +.10	33.6 +1.9	18.07 +.22	64.8 −2.7	12.50 +.08	42.6 +0.4
19.0	13.66 .21	50.7 1.8	2.68 .14	31.6 2.1	18.36 .36	62.1 2.5	12.61 .12	43.2 0.7
28.9	13.91 .28	49.1 1.4	2.84 .18	29.4 2.2	18.80 .50	59.6 2.1	12.75 .17	44.0 0.9
May 8.9	14.22 .34	47.8 1.0	3.05 .22	27.1 2.3	19.36 .61	57.9 1.7	12.94 .21	45.0 1.2
18.9	14.59 .39	47.0 −0.5	3.29 .26	24.7 2.4	20.03 .71	56.4 1.2	13.16 .24	46.4 1.4
28.9	15.01 +.43	46.8 0.0	3.56 +.28	22.3 +2.4	20.79 +.79	55.5 −0.7	13.42 +.27	47.9 +1.6
June 7.8	15.46 .46	47.0 +0.5	3.86 .31	19.9 2.3	21.61 .84	55.1 −0.1	13.70 .29	49.6 1.8
17.8	15.93 .47	47.7 0.9	4.17 .32	17.6 2.2	22.47 .87	55.2 +0.4	14.01 .31	51.5 1.9
27.8	16.41 .48	48.8 1.4	4.50 .33	15.5 2.0	23.35 .87	55.9 0.9	14.32 .32	53.5 2.0
July 7.7	16.88 .46	50.5 1.8	4.82 .32	13.6 1.8	24.22 .85	57.1 1.5	14.64 .31	55.5 2.0
17.7	17.34 +.44	52.5 +2.2	5.15 +.31	11.9 +1.5	25.06 +.82	58.8 +1.9	14.95 +.30	57.5 +2.0
27.7	17.77 .41	54.9 2.5	5.45 .30	10.5 1.2	25.86 .76	61.0 2.4	15.25 .29	59.5 1.9
Aug. 6.7	18.16 .37	57.6 2.8	5.74 .27	9.5 0.9	26.58 .68	63.6 2.8	15.53 .27	61.3 1.8
16.6	18.51 .32	60.5 3.0	5.99 .24	8.8 0.5	27.22 .60	66.5 3.1	15.78 .24	63.0 1.6
26.6	18.81 .27	63.6 3.1	6.21 .20	8.5 +0.2	27.77 .50	69.8 3.3	16.01 .21	64.5 1.4
Sept. 5.6	19.05 +.22	66.8 +3.2	6.40 +.17	8.5 −0.2	28.22 +.39	73.2 +3.5	16.20 +.17	65.9 +1.2
15.5	19.24 .16	70.1 3.3	6.55 .13	8.9 0.5	28.56 .28	76.8 3.6	16.36 .14	67.0 1.0
25.5	19.37 .10	73.3 3.2	6.66 .09	9.5 0.8	28.78 .16	80.5 3.7	16.48 .11	67.8 0.8
Oct. 5.5	19.44 +.05	76.5 3.1	6.73 .05	10.4 1.0	28.88 +.04	84.2 3.7	16.57 .07	68.5 0.5
15.5	19.46 −.01	79.6 2.9	6.76 +.02	11.5 1.2	28.87 −.07	87.9 3.6	16.63 .04	68.9 0.3
25.4	19.42 −.06	82.4 +2.7	6.76 −.01	12.7 −1.3	28.73 −.19	91.4 +3.4	16.66 +.01	69.1 +0.1
Nov. 4.4	19.34 .11	85.0 2.4	6.73 .04	14.0 1.3	28.49 .30	94.6 3.1	16.66 −.01	69.2 0.0
14.4	19.20 .15	87.2 2.0	6.68 .06	15.4 1.3	28.13 .40	97.6 2.8	16.63 .04	69.0 −0.2
24.3	19.03 .19	89.1 1.6	6.60 .08	16.6 1.2	27.68 .50	100.1 2.3	16.58 .06	68.7 0.3
Dec. 4.3	18.81 .23	90.5 1.2	6.51 .10	17.8 1.1	27.14 .58	102.2 1.9	16.52 .08	68.4 0.4
14.3	18.57 −.26	91.5 +0.7	6.40 −.11	18.8 −0.9	26.52 −.65	103.8 +1.3	16.43 −.09	67.9 −0.5
24.3	18.30 .28	91.9 +0.2	6.29 .12	19.6 0.7	25.84 .69	104.8 0.7	16.33 .10	67.3 0.6
34.2	18.02 −.28	91.9 −0.3	6.17 −.11	20.2 −0.5	25.13 −.72	105.3 +0.1	16.23 −.11	66.7 −0.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Andromedæ.		θ¹ Ceti.		38 Cassiopeæ.		η Piscium.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	$1^{h}\ 3^{m}$	$+35^{\circ}\ 2'$	$1^{h}\ 18^{m}$	$-\ 8^{\circ}\ 44'$	$1^{h}\ 22^{m}$	$+69^{\circ}\ 41'$	$1^{h}\ 25^{m}$	$+14^{\circ}\ 46'$
(Dec.30.3)	$33^{s}.55$ −.16	$17''.5$ −0.2	$30^{s}.73$ −.11	$75''.1$ −0.8	$62^{s}.42$ −.49	$64''.9$ +0.8	$35^{s}.07$ −.11	$40''.0$ −0.5
Jan. 9.3	33.39 .16	17.1 0.6	30.61 .12	75.8 0.6	61.91 .52	65.4 +0.2	34.95 .12	39.4 0.6
19.2	33.22 .17	16.4 0.9	30.49 .12	76.3 0.4	61.37 .54	65.4 −0.4	34.82 .13	38.8 0.7
29.2	33.05 .16	15.4 1.1	30.37 .12	76.7 −0.2	60.83 .53	64.7 0.9	34.69 .13	38.1 0.7
Feb. 8.2	32.89 .15	14.1 1.3	30.25 .11	76.8 0.0	60.31 .50	63.5 1.4	34.56 .12	37.4 0.8
18.1	32.75 −.13	12.7 −1.5	30.14 −.10	76.8 +0.2	59.84 −.44	61.8 −1.9	34.44 −.11	36.6 −0.7
28.1	32.63 .10	11.1 1.6	30.04 .08	76.5 0.4	59.43 .37	59.7 2.3	34.34 .09	35.9 0.7
Mar. 10.1	32.55 .06	9.4 1.6	29.97 .05	76.0 0.6	59.10 .28	57.3 2.5	34.26 .06	35.2 0.6
20.1	32.51 −.02	7.8 1.5	29.93 −.02	75.2 0.9	58.87 .17	54.7 2.7	34.21 −.03	34.7 0.4
30.0	32.51 +.03	6.3 1.4	29.93 +.02	74.2 1.1	58.76 −.05	51.9 2.7	34.20 +.01	34.3 0.3
Apr. 9.0	32.57 +.08	5.0 −1.2	29.97 +.06	72.9 +1.4	58.77 +.07	49.2 −2.7	34.23 +.05	34.2 −0.1
19.0	32.68 .14	3.9 0.9	30.04 .10	71.4 1.6	58.90 .19	46.5 2.5	34.31 .10	34.2 +0.2
29.0	32.84 .19	3.2 0.6	30.16 .14	69.8 1.8	59.14 .30	44.1 2.2	34.43 .14	34.6 0.5
May 8.9	33.05 .23	2.7 −0.3	30.33 .18	67.9 2.0	59.51 .41	42.0 1.9	34.60 .19	35.2 0.7
18.9	33.31 .28	2.7 +0.1	30.53 .22	65.8 2.1	59.97 .51	40.3 1.5	34.81 .23	36.0 1.0
28.9	33.61 +.31	3.0 +0.5	30.77 +.25	63.7 +2.2	60.52 +.59	39.1 −1.0	35.05 +.26	37.2 +1.2
June 7.8	33.93 .34	3.7 0.9	31.04 .28	61.5 2.2	61.15 .65	38.3 −0.5	35.33 .29	38.5 1.5
17.8	34.28 .35	4.7 1.2	31.33 .30	59.3 2.2	61.81 .68	38.0 0.0	35.63 .31	40.1 1.7
27.8	34.64 .36	6.1 1.5	31.64 .31	57.1 2.1	62.52 .71	38.2 +0.5	35.94 .32	41.9 1.8
July 7.8	35.00 .36	7.8 1.8	31.95 .31	55.0 2.0	63.24 .72	39.0 1.0	36.26 .32	43.7 1.9
17.7	35.36 +.35	9.7 +2.1	32.27 +.31	53.1 +1.8	63.95 +.71	40.2 +1.5	36.59 +.32	45.7 +2.0
27.7	35.70 .33	11.9 2.2	32.57 .30	51.4 1.6	64.65 .68	41.9 1.9	36.90 .31	47.6 1.9
Aug. 6.7	36.02 .30	14.2 2.3	32.86 .28	49.9 1.3	65.31 .64	44.0 2.3	37.19 .29	49.6 1.9
16.6	36.32 .27	16.6 2.4	33.13 .26	48.8 1.0	65.92 .59	46.5 2.6	37.47 .26	51.4 1.8
26.6	36.58 .24	19.0 2.4	33.38 .23	47.9 0.7	66.48 .52	49.3 2.9	37.72 .23	53.2 1.7
Sept. 5.6	36.80 +.20	21.5 +2.4	33.59 +.20	47.3 +0.4	66.96 +.45	52.4 +3.2	37.94 +.20	54.8 +1.5
15.6	36.99 .17	23.9 2.4	33.77 .16	47.1 +0.1	67.37 .36	55.7 3.4	38.13 .17	56.2 1.3
25.5	37.13 .13	26.3 2.3	33.91 .13	47.1 −0.2	67.69 .28	59.1 3.5	38.28 .14	57.5 1.2
Oct. 5.5	37.24 .09	28.5 2.1	34.02 .09	47.5 0.4	67.93 .19	62.6 3.5	38.40 .11	58.5 1.0
15.5	37.31 .05	30.5 1.9	34.10 .06	48.0 0.7	68.08 .10	66.1 3.5	38.49 .07	59.4 0.8
25.5	37.34 +.02	32.4 +1.7	34.14 +.03	48.8 −0.8	68.13 +.01	69.5 +3.4	38.55 +.04	60.1 +0.6
Nov. 4.4	37.34 −.02	34.0 1.5	34.15 .00	49.7 0.9	68.10 −.08	72.8 3.2	38.58 +.01	60.5 0.4
14.4	37.31 .05	35.4 1.2	34.14 −.02	50.7 1.0	67.97 .17	75.9 2.9	38.58 −.01	60.8 +0.2
24.4	37.25 .08	36.5 0.9	34.10 .05	51.7 1.0	67.76 .25	78.6 2.6	38.55 .04	60.9 0.0
Dec. 4.3	37.15 .10	37.3 0.6	34.05 .07	52.8 1.0	67.46 .33	81.0 2.2	38.50 .06	60.9 −0.1
14.3	37.04 −.12	37.8 +0.3	33.97 −.09	53.8 −0.9	67.09 −.40	82.9 +1.7	38.43 −.08	60.7 −0.3
24.3	36.91 .14	37.9 0.0	33.87 .10	54.6 0.8	66.66 .46	84.4 1.2	38.34 .10	60.4 0.4
34.3	36.76 −.16	37.8 −0.3	33.77 −.11	55.4 −0.7	66.17 −.52	85.3 +0.6	38.23 −.11	59.9 −0.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α* Eridani. (*Achernar.*)		*o* Piscium.		*β* Arietis.		50 Cassiopeæ.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 1 33	° ′ −57 47	h m 1 39	° ′ + 8 36	h m 1 48	° ′ +20 16	h m 1 53	° ′ +71 53
	s	″	s	″	s	″	s	″
(Dec.30.3)	36.50 −.31	68.7 −0.8	34.42 −.10	8.4 −0.6	33.16 −.11	11.2 −0.3	62.78 −.52	30.4 +1.3
Jan. 9.3	36.19 .32	69.1 −0.1	34.31 .12	7.8 0.6	33.04 .13	10.8 0.4	62.23 .57	31.4 0.7
19.2	35.86 .32	69.0 +0.5	34.19 .13	7.2 0.6	32.90 .14	10.3 0.6	61.63 .61	31.8 +0.1
39.2	35.54 .31	68.2 1.0	34.06 .13	6.6 0.6	32.76 .14	9.6 0.7	61.02 .61	31.6 −0.5
Feb. 8.2	35.24 .29	67.0 1.5	33.93 .13	6.1 0.6	32.61 .14	8.9 0.8	60.41 .60	30.8 1.0
18.1	34.95 −.26	65.2 +2.0	33.80 −.12	5.5 −0.5	32.47 −.13	8.1 −0.8	59.82 −.55	29.5 −1.5
28.1	34.71 .23	62.9 2.4	33.70 .10	5.1 0.4	32.35 .11	7.2 0 8	59.30 .48	27.7 2.0
Mar. 10.1	34.50 .18	60.3 2.8	33.61 .07	4.8 0.3	32.25 .09	6.4 0.8	58.86 .39	25.6 2.5
20.1	34.35 .12	57.3 3.1	33.55 −.04	4.6 −0.1	32.18 .05	5.6 0.7	58.52 .28	23.1 2.6
30.0	34.26 −.06	54.1 3.4	33.53 .00	4.6 +0.1	32.14 −.01	5.0 0.6	58.30 .15	20.5 2.7
Apr. 9.0	34.23 .00	50.6 +3.5	33.55 +.04	4.8 +0.3	32.15 +.03	4.5 −0.4	58.21 −.02	17.7 −2.7
19.0	34.27 +.07	47.0 3.6	33.61 .08	5.2 0.6	32.21 .08	4.2 −0.2	58.26 +.12	15.0 2.6
29.0	34.38 .14	43.4 3.6	33.71 .13	5.9 0.8	32.31 .13	4.2 +0.1	58.44 .25	12.5 2.4
May 8.9	34.56 .21	39.7 3.6	33.86 .17	6.8 1 0	32.46 .17	4.4 0.4	58.76 .38	10.1 2.1
18.9	34.81 .28	36.2 3.4	34.06 .21	8.0 1.3	32.66 .21	4.9 0.6	59.19 .49	8.1 1.8
28.9	35.12 +.34	32.9 +3.2	34.29 +.25	9.4 +1.5	32.89 +.25	5.7 +0.9	59.74 +.59	6.5 −1.4
June 7.8	35.48 .39	29.8 2.9	34.55 .27	10.9 1.6	33.16 .28	6.7 1.1	60.37 .67	5.3 1.0
17.8	35.90 .43	27.0 2.6	34.84 .30	12.6 1.8	33.46 .31	8.0 1.4	61.08 .73	4.6 −0.5
27.8	36.35 .46	24.7 2.1	35.14 .31	14.5 1.9	33.77 .32	9.4 1.6	61.84 .77	4.3 0.0
July 7.8	36.83 .48	22.7 1.7	35.46 .32	16.4 1.9	34.10 .33	11.1 1.7	62.63 .80	4.6 +0.5
17.7	37.31 +.49	21.3 +1.2	35.77 +.31	18.3 +1.9	34.43 +.33	12.9 +1.8	63.43 +.80	5.4 +1.0
27.7	37.80 .48	20.5 +0.6	36.08 .30	20.2 1.8	34.75 .32	14.7 1.9	64.23 .79	6.7 1.5
Aug. 6.7	38.27 .46	20.2 0.0	36.38 .29	22.0 1.7	35.06 .30	16.6 1.9	65.00 .75	8.4 1.9
16.7	38.72 .43	20.5 −0.6	36.66 .27	23.7 1.6	35.36 .28	18.5 1.9	65.73 .71	10.5 2.3
26.6	39.13 .38	21.3 1.1	36.91 .24	25.2 1.4	35.63 .26	20.4 1.8	66.41 .65	12.9 2.6
Sept. 5.6	39.49 +.33	22.7 −1.6	37.14 +.21	26.5 +1.2	35.87 +.23	22.1 +1.7	67.02 +.58	15.7 +2.9
15.6	39.79 .27	24.5 2.1	37.34 .18	27.7 1.0	36.08 .20	23.8 1.6	67.56 .50	18.8 3.2
25.5	40.02 .20	26.8 2.4	37.50 .15	28.6 0.8	36.26 .16	25.2 1.4	68.02 .41	22.1 3.3
Oct. 5.5	40.19 .13	29.3 2.7	37.63 .12	29.3 0.6	36.41 .13	26.6 1.2	68.38 .32	25.5 3.4
15.5	40.29 +.06	32.1 2.8	37.74 .09	29.7 0.4	36.53 .10	27.7 1.1	68.65 .22	28.9 3.5
25.5	40.32 −.01	35.0 −2.9	37.81 +.06	30.0 +0.2	36.61 +.07	28.7 +0.9	68.82 +.11	32.4 +3.4
Nov. 4.4	40.28 .07	37.9 2.8	37.85 +.03	30.1 0.0	36.67 .04	29.4 0.7	68.88 +.01	35.8 3.3
14.4	40.17 .13	40.7 2.6	37.86 .00	30.0 −0.1	36.69 +.01	30.0 0.5	68.83 −.10	39.0 3.1
24.4	40.01 .19	43.2 2.3	37.85 −.03	29.8 0.3	36.69 −.02	30.5 0.3	68.69 .20	42.1 2.9
Dec. 4.4	39.80 .23	45.3 2.0	37.81 .05	29.5 0.4	36.65 .05	30.7 +0.2	68.43 .30	44.8 2.5
14.3	39.55 −.27	47.1 −1.5	37.75 −.07	29.0 −0.5	36.59 −.07	30.8 0.0	68.08 −.39	47.1 +2.1
24.3	39.26 .30	48.3 1.0	37.67 .09	28.6 0.5	36.51 .09	30.7 −0.2	67.64 .47	48.9 1.6
34.3	38.95 −.31	49.1 −0.5	37.57 −.11	28.0 −0.6	36.41 −.11	30.5 −0.3	67.14 −.54	50.3 +1.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Arietis.		ξ¹ Ceti.		ι Cassiopeæ.		ξ² Ceti.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 2 0	+22° 56′	h m 2 7	+ 8° 19′	h m 2 19	+66° 54′	h m 2 22	+ 7° 57′
	s	″	s	″	s	″	s	″
(Dec.30.3)	57.78 −.11	30.9 −0.1	9.66 −.09	44.5 −0.6	60.16 −.36	36.5 +1.4	18.19 −.08	55.0 −0.6
Jan. 9.3	57.66 .13	30.7 0.3	9.56 .11	43.9 0.6	59.77 .41	37.7 0.9	18.09 .11	54.4 0.5
19.2	57.52 .14	30.3 0.5	9.44 .13	43.4 0.6	59.34 .45	38.3 +0.3	17.97 .13	53.9 0.5
29.2	57.37 .15	29.7 0.7	9.30 .14	42.8 0.5	58.87 .47	38.3 −0.2	17.84 .14	53.3 0.5
Feb. 8.2	57.22 .15	29.0 0.8	9.16 .14	42.3 0.5	58.39 .48	37.9 0.7	17.70 .14	52.9 0.5
18.2	57.07 −.14	28.1 −0.9	9.03 −.13	41.8 −0.4	57.93 −.45	36.9 −1.2	17.56 −.14	52.4 −0.4
28.2	56.94 .12	27.3 0.9	8.90 .12	41.5 0.3	57.50 .40	35.4 1.7	17.42 .13	52.1 0.3
Mar. 10.1	56.82 .10	26.4 0.9	8.79 .10	41.2 0.2	57.12 .34	33.6 2.0	17.31 .11	51.8 −0.2
20.1	56.74 .07	25.5 0.8	8.71 .07	41.0 −0.1	56.82 .26	31.4 2.3	17.21 .08	51.7 0.0
30.1	56.69 −.03	24.7 0.7	8.66 −.03	41.1 +0.1	56.60 .17	29.0 2.5	17.15 −.04	51.8 +0.1
Apr. 9.1	56.69 +.02	24.1 −0.5	8.66 +.01	41.3 +0.3	56.49 −.06	26.5 −2.5	17.12 .00	52.0 +0.3
19.0	56.73 .06	23.7 0.3	8.69 .06	41.7 0.5	56.48 +.04	23.9 2.5	17.15 +.04	52.4 0.5
29.0	56.82 .12	23.5 −0.1	8.77 .10	42.3 0.8	56.58 .16	21.5 2.4	17.21 .09	53.1 0.8
May 9.0	56 97 .16	23.5 +0.2	8.89 .15	43.2 1.0	56.79 .27	19.2 2.1	17.32 .13	53.9 1.0
18.9	57.15 .21	23.8 0.4	9.06 .19	44.3 1.2	57.10 .36	17.2 1.8	17.48 .18	55.0 1.2
28.9	57.38 +.25	24.4 +0.7	9.27 +.23	45.6 +1.4	57.51 +.45	15.6 −1.5	17.67 +.22	56.3 +1.4
June 7.9	57.65 .28	25.2 1.0	9.52 .26	47.1 1.6	57.99 .52	14.3 1.0	17.91 .25	57.8 1.6
17.9	57.94 .30	26.3 1.2	9.79 .28	48.8 1.7	58.55 .58	13.5 0.6	18.17 .27	59.4 1.7
27.8	58.26 .32	27.6 1.4	10.08 .30	50.6 1.8	59.15 .62	13.1 −0.2	18.46 .29	61.2 1.8
July 7.8	58.59 .33	29.2 1.6	10 39 .31	52.4 1.8	59.79 .65	13.2 +0.3	18.76 .31	62.9 1.8
17.8	58.92 +.33	30.8 +1.7	10.70 +.31	54.2 +1.8	60.45 +.66	13.7 +0.8	19.07 +.31	64.8 +1.8
27.7	59.25 .32	32.6 1.8	11.02 .31	56.1 1.8	61.11 .66	14.7 1.2	19.38 .31	66.5 1.7
Aug. 6.7	59.57 .31	34.5 1.9	11.32 .30	57.8 1.7	61.77 .64	16.1 1.6	19.69 .30	68.3 1.6
16.7	59.88 .29	36.3 1.9	11.61 .28	59.4 1.5	62.40 .61	17.9 2.0	19.98 .29	69.8 1.5
26.7	60.16 .27	38.2 1.8	11.88 .26	60.9 1.4	62.99 .57	20.1 2.3	20.26 .27	71.2 1.3
Sept. 5.6	60.42 +.24	40.0 +1.7	12.12 +.23	62.2 +1.2	63.54 +.52	22.6 +2.6	20.51 +.24	72.5 +1.1
15.6	60.64 .21	41.7 1.6	12.34 .20	63.2 1.0	64.04 .47	25.3 2.9	20.74 .22	73.5 0.9
25.6	60.84 .18	43.2 1.5	12.53 .17	64.1 0.7	64.47 .40	28.3 3.1	20.95 .19	74.3 0.7
Oct. 5.6	61.00 .15	44.7 1.4	12.69 .14	64.7 0.5	64.84 .33	31.4 3.2	21.12 .16	74.9 0.5
15.5	61.13 .12	45.9 1.2	12.82 .11	65.1 0.3	65.13 .26	34.6 3.2	21.27 .13	75.2 0.3
25.5	61.23 +.09	47.0 +1.0	12.92 +.08	65.3 +0.1	65.35 +.18	37.8 +3.2	21.38 +.10	75.4 +0.1
Nov. 4.5	61.30 .06	48.0 0.8	12.99 .05	65.3 −0.1	65.49 .09	41.1 3.1	21.47 .07	75.4 −0.1
14.4	61.34 +.03	48.8 0.6	13.03 +.03	65.2 0.2	65.54 +.01	44.1 3.0	21.52 .04	75.2 0.2
24.4	61.35 −.01	49.4 0.5	13.04 .00	65.0 0.3	65.51 −.07	47.1 2.8	21.55 +.01	74.9 0.3
Dec. 4.4	61.33 .04	49.8 0.3	13.03 −.03	64.6 0.4	65.39 .16	49.7 2.5	21.55 −.02	74.5 0.4
14.4	61.28 −.07	50.0 +0.1	12.99 −.05	64.2 −0.5	65.19 −.24	52.0 +2.1	21.51 −.04	74.1 −0.5
24.3	61.20 .09	50.0 −0.1	12.92 .08	63.7 0.5	64.92 .31	54.0 1.7	21.46 .07	73.6 0.5
34.3	61.10 −.12	49.9 −0.3	12.83 −.11	63.2 −0.6	64.57 −.37	55.5 +1.2	21.37 −.09	73.1 −0.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Ceti.		α Ceti.		48 Cephei (H.)		ζ Arietis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 2 37	+ 2° 46′	h m 2 56	+ 3° 39′	h m 3 6	+77° 19′	h m 3 8	+20° 38′
	s	″	s	″	s	″	s	″
(Dec.30.3	35.67 −.08	12.3 −0.7	31.48 −.07	22.1 −0.7	24.19 −.57	56.2 +2.2	34.47 −.07	9.8 0.0
Jan. 9.3	35.58 .11	11.6 0.6	31.39 .10	21.5 0.6	23.54 .71	58.1 1.7	34.39 .10	9.7 −0.1
19.3	35.46 .13	11.0 0.6	31.28 .12	20.9 0.6	22.78 .81	59.6 1 2	34.27 .13	9.5 0.2
29.3	35.33 .14	10.5 0.5	31.15 .14	20.4 0.5	21.93 .87	60.5 +0.6	34.13 .15	9.2 0.3
Feb. 8.2	35.19 .14	10.1 0.4	31.00 .15	19.9 0.4	21.03 .91	60.8 0.0	33.98 .16	8.9 0.4
18.2	35.04 −.14	9.8 −0.3	30.85 −.15	19.6 −0.3	20.11 −.90	60.5 −0.6	33.82 −.16	8.4 −0.5
28.2	34.90 .13	9.6 −0.1	30.70 .14	19.4 −0.1	19.22 .85	59.6 1.1	33.65 .16	7.9 0.5
Mar. 10.2	34.77 .12	9.5 0.0	30.57 .13	19.3 0.0	18.41 .77	58.3 1.6	33.50 .14	7.3 0.5
20.1	34.67 .09	9.7 +0.2	30.45 .10	19.4 +0.2	17.68 .66	56.4 2.0	33.36 .12	6.8 0.5
30.1	34.59 .06	10.0 0.4	30.36 .07	19.7 0.4	17.10 .50	54.2 2.4	33.26 .09	6.3 0.5
Apr. 9.1	34.56 −.02	10.5 +0.6	30.30 −.03	20.1 +0.6	16.68 −.33	51.7 −2.6	33.19 −.05	5.9 −0.4
19.0	34.56 +.02	11.2 0.8	30.29 +.01	20.8 0.8	16.44 −.15	49.0 2.7	33.17 .00	5.6 0.2
29.0	34.61 .07	12.1 1.0	30.32 .05	21.6 1.0	16.37 +.03	46.2 2.7	33.19 +.05	5.4 −0.1
May 9.0	34.70 .12	13.3 1.2	30.39 .10	22.7 1.2	16.51 .23	43.5 2.6	33.26 .10	5.4 +0.1
19.0	34.84 .16	14.6 1.4	30.51 .14	23.9 1.4	16.83 .41	41.0 2.4	33.38 .14	5.7 0.3
28.9	35.02 +.20	16.1 +1.6	30.68 +.18	25.4 +1.5	17.33 +.58	38.6 −2.2	33.55 +.19	6.1 +0.5
June 7.9	35.23 .23	17.8 1.7	30.88 .22	27.0 1.6	17.99 .73	36.6 1.9	33.76 .23	6.8 0.8
17.9	35.48 .26	19.6 1.8	31.12 .25	28.7 1.7	18.79 .86	34.9 1.5	34.01 .26	7.6 1.0
27.8	35.76 .28	21.5 1.9	31.39 .28	30.5 1.8	19.71 .97	33 6 1.0	34.29 .29	8.6 1.1
July 7.8	36.05 .30	23.4 1.9	31.67 .29	32.3 1.8	20.72 1.05	32.8 0.6	34.59 .30	9.9 1.3
17.8	36.36 +.31	25.2 +1.8	31.97 +.30	34.1 +1.8	21.80+1.10	32.5 −0.1	34.90 +.31	11.2 +1.4
27.8	36.67 .30	27.0 1.7	32.28 .31	35.8 1.7	22.93 1.13	32.6 +0.4	35.23 .32	12.6 1.4
Aug. 6.7	36.97 .30	28.7 1.6	32.59 .30	37.5 1.5	24.07 1.14	33.2 0.8	35.55 .32	14.0 1.5
16.7	37.27 .29	30.1 1.4	32.88 .29	38.9 1.4	25.21 1.12	34.2 1.3	35.87 .31	15.5 1.5
26.7	37.55 .27	31.4 1.2	33.17 .28	40.2 1 2	26.32 1.09	35.7 1.7	36.18 .30	17.0 1.4
Sept. 5.7	37.81 +.25	32.4 +0.9	33.44 +.26	41.2 +0.9	27.39+1.03	37.6 +2.1	36.47 +.28	18.3 +1.3
15.6	38.05 .23	33.2 0.7	33.69 .24	42.0 0.7	28.38 .95	39.9 2.4	36.75 .26	19.6 1.2
25.6	38.26 .20	33.7 0.4	33.92 .21	42.6 0.4	29.29 .86	42.5 2.7	37.00 .24	20.8 1.1
Oct. 5.6	38.44 .17	34.0 +0.2	34.12 .19	42.8 +0.2	30.11 .75	45.4 3.0	37.23 .21	21.9 1.0
15.5	38.60 .14	34.1 −0.1	34.30 .16	42.9 0.0	30.80 .63	48.5 3.2	37.42 .19	22.8 0.9
25.5	38.73 +.11	33.9 −0.3	34.44 +.13	42.7 −0.2	31.36 +.49	51.8 +3.3	37.60 +.16	23.6 +0.7
Nov. 4.5	38.82 .08	33.5 0.4	34.56 .10	42.4 0.4	31.78 .34	55.2 3.4	37.74 .13	24.2 0.6
14.5	38.89 .05	33.0 0.5	34.65 .07	41.9 0.5	32.05 .18	58.6 3.4	37.85 .09	24.8 0.5
24.4	38.93 +.02	32.4 0.6	34.70 .04	41.3 0.6	32.14 +.01	62.0 3.3	37.93 .06	25.2 0.4
Dec. 4.4	38.94 −.01	31.7 0.7	34.73 +.01	40.6 0.7	32.07 −.16	65.2 3.1	37.97 +.03	25.5 0.3
14.4	38.92 −.04	31.0 −0.7	34.72 −.02	39.9 −0.7	31.83 −.32	68.2 +2.8	37.98 −.01	25.7 +0.2
24.4	38.87 .06	30.3 0.7	34.69 .05	39.2 0.7	31.43 .48	70.9 2.5	37.95 .04	25.8 +0.1
34.3	38.79 −.09	29.6 −0.6	34.62 −.08	38.6 −0.6	30.88 −.62	73.2 +2.1	37.89 −.08	25.8 0.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α* Persei.		*ε* Eridani.		*δ* Persei.		*η* Tauri.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 3 16	° ′ +49 28	h m 3 27	° ′ − 9 49	h m 3 35	° ′ +47 25	h m 3 40	° ′ +23 45
	s	″	s	″	s	″	s	″
(Dec 30.4)	28.23 −.12	14.2 +1.2	44.83 −.07	59.7 −1.2	5.68 −.09	71.2 +1.3	56.61 −.05	51.5 +0.2
Jan. 9.3	28.08 .17	15.3 0.9	44.74 .10	60.8 1.0	5.56 .14	72.3 1.0	56.54 .08	51.7 +0.1
19.3	27.89 .21	16.1 0.5	44.63 .12	61.7 0.8	5.40 .18	73.2 0.7	56.44 .12	51.7 0.0
29.3	27.67 .24	16.4 +0.2	44.50 .14	62.5 0.6	5.20 .22	73.7 +0.3	56.31 .14	51.6 −0.1
Feb. 8.2	27.42 .26	16.4 −0.2	44.35 .16	62.9 0.3	4.96 .24	73.8 0.0	56.15 .16	51.4 0.2
18.2	27.16 −.26	16.0 −0.6	44.18 −.16	63.2 −0.1	4.71 −.25	73.6 −0.4	55.98 −.17	51.1 −0.3
28.2	26.89 .25	15.3 0.9	44.02 .16	63.2 +0.1	4.46 .25	73.1 0.7	55.80 .18	50.7 0.4
Mar. 10.2	26.65 .23	14.2 1.2	43.86 .15	62.9 0.4	4.22 .23	72.2 1.0	55.63 .17	50.3 0.5
20.1	26.43 .20	12.8 1.4	43.71 .13	62.3 0.7	4.00 .20	71.1 1.2	55.47 .14	49.7 0.5
30.1	26.25 .15	11.3 1.6	43.59 .11	61.5 0.9	3.81 .16	69.7 1.4	55.34 .11	49.2 0.5
Apr. 9.1	26.13 −.09	9.7 −1.7	43.50 −.07	60.4 +1.2	3.68 −.11	68.2 −1.5	55.25 −.07	48.7 −0 5
19.1	26.07 −.03	7.9 1.7	43.45 −.03	59.1 1.4	3.60 −.05	66.7 1.6	55.19 −.03	48.3 0.4
29.0	26.08 +.04	6.2 1.6	43.44 +.01	57.6 1.6	3.58 +.02	65.1 1.5	55.18 +.02	47.9 0.3
May 9.0	26.16 .11	4.6 1.5	43.47 .06	55.8 1.8	3.64 .08	63.6 1.4	55.23 .07	47.7 −0.1
19.0	26.30 .18	3.2 1.3	43.55 .10	53.9 2.0	3.75 .15	62.2 1.3	55.32 .12	47.7 +0.1
28.9	26.51 +.24	2.0 −1.1	43.68 +.15	51.8 +2.1	3.93 +.21	61.0 −1.1	55.46 +.16	47.9 +0.2
June 7.9	26.78 .30	1.1 0.8	43.85 .19	49.6 2.2	4.18 .27	60.1 0.8	55.65 .20	48.2 0.4
17.9	27.10 .34	0.5 0.5	44.06 .22	47.4 2.2	4.47 .32	59.4 0.5	55.87 .24	48.8 0.6
27.9	27.47 .38	0.1 −0.1	44.29 .25	45.1 2.2	4.81 .36	59.1 −0.2	56.13 .28	49 5 0.8
July 7.8	27.86 .41	0.2 +0.2	44.56 .27	42.9 2.1	5.18 .39	59.0 +0.1	56.42 .30	50.4 1.0
17.8	28.28 +.43	0.5 +0.5	44.84 +.29	40.8 +2.0	5.58 +.41	59.2 +0.4	56.73 +.32	51.4 +1.1
27.8	28.72 .44	1.2 0.8	45.13 .30	39.0 1.8	5.99 .42	59.7 0.6	57.05 .33	52.5 1.2
Aug. 6.8	29.16 .44	2.1 1.1	45.43 .30	37.3 1.6	6.42 .43	60.5 0.9	57.38 .33	53.7 1.2
16.7	29.60 .43	3.4 1.4	45.73 .29	35.9 1.2	6.84 .42	61.5 1.2	57.71 .33	55.0 1.2
26.7	30.02 .41	4.9 1.6	46.02 .28	34.8 0.9	7.26 .41	62.8 1.4	58.03 .32	56.2 1.2
Sept. 5.7	30.43 +.39	6.6 +1.8	46.30 +.27	34.1 +0.5	7.67 +.39	64.3 +1.6	58.35 +.31	57.4 +1.2
15.6	30.81 .37	8.4 2.0	46.57 .25	33.7 +0.2	8.05 .37	65.9 1.7	58.64 .29	58.6 1.1
25.6	31.16 .34	10.5 2.1	46.81 .23	33.7 −0.2	8.41 .35	67.7 1.8	58.92 .27	59.7 1.1
Oct. 5.6	31.49 .30	12.6 2.2	47.03 .21	34.1 0.5	8.74 .32	69.6 1.9	59.18 .25	60.7 1.0
15.6	31.77 .26	14.8 2.2	47.23 .18	34.7 0.8	9.04 .28	71.6 2.0	59.42 .22	61.6 0.9
25.5	32.01 +.22	17.1 +2.2	47.40 +.15	35.7 −1.1	9.30 +.24	73.6 +2.0	59.62 +.19	62.5 +0.8
Nov. 4.5	32.22 .18	19.3 2.2	47.54 .12	36.8 1.3	9.53 .20	75.7 2.0	59.80 .17	63.2 0.7
14.5	32.37 .13	21.5 2.2	47.65 .09	38.2 1.4	9.71 .15	77.7 2.0	59.95 .13	63.8 0.6
24.5	32.47 .08	23.6 2.1	47.72 .06	39.6 1.5	9.84 .10	79.7 1.9	60.07 .10	64.4 0.5
Dec. 4.4	32.52 +.02	25.6 1.9	47.77 +.03	41.1 1.5	9.92 +.05	81.6 1.8	60.15 .06	64.8 0.4
14.4	32.52 −.03	27.4 +1.7	47.78 −.01	42.5 −1.4	9.94 .00	83.3 +1.6	60.19 +.02	65.2 +0.3
24.4	32.46 .08	29.0 1.4	47.75 .04	43.9 1.3	9.92 −.05	84.8 1.4	60.19 −.02	65.5 0.2
34.4	32.35 −.13	30.3 +1.1	47.69 −.08	45.1 −1.1	9.84 −.11	86.2 +1.2	60.15 −.06	65.7 +0.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Persei.		γ Eridani.		γ Tauri.		ε Tauri.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 3 47	+31° 33′	h m 3 52	−13° 49′	h m 4 13	+15° 21′	h m 4 22	+18° 56′
	s	″	s	″	s	″	s	″
(Dec.30.4)	13.00 −.05	23.9 +0.6	53.99 −.05	27.7 −1.4	32.02 −.01	39.1 −0.2	11.62 −.01	7.6 0.0
Jan. 9.3	12.93 .09	24.4 0.4	53.92 .09	29.1 1.2	31.99 .05	38.9 0.2	11.60 .05	7.6 0.0
19.3	12.82 .12	24.7 0.2	53.82 .12	30.2 1.0	31.91 .09	38.7 0.2	11.52 .09	7.5 −0.1
29.3	12.68 .16	24.9 +0.1	53.68 .14	31.1 0.7	31.80 .12	38.5 0.2	11.42 .12	7.4 0.1
Feb. 8.3	12.51 .18	24.8 −0.1	53.53 .16	31.7 0.5	31.66 .15	38.2 0.2	11.28 .15	7.3 0 1
18.2	12.32 −.19	24.6 −0.3	53.36 −.17	32.0 −0.2	31.50 −.16	38.0 −0.2	11.12 −.17	7.1 −0.2
28.2	12.13 .19	24.2 0.5	53.19 .17	32.0 +0.1	31.33 .17	37.8 0.2	10.95 .18	6.9 0.2
Mar. 10.2	11.94 .18	23.6 0.6	53.01 .17	31.8 0.4	31.16 .17	37.6 0.2	10.77 .17	6.7 0.2
20.2	11.76 .16	23.0 0.7	52.85 .16	31.2 0.7	31.00 .15	37.4 0.2	10.60 .16	6.4 0.2
30.1	11.62 .13	22.2 0.8	52.71 .13	30.3 1.0	30.86 .13	37.2 −0.1	10.45 .14	6.2 0.2
Apr. 9.1	11.51 −.09	21.4 −0.8	52.60 −.09	29.2 +1.3	30.74 −.10	37.2 0.0	10.33 −.10	6.0 −0.2
19.1	11.44 −.04	20.6 0.8	52.53 .05	27.8 1.5	30.66 .06	37.2 +0.1	10.24 .06	5.9 −0.1
29.1	11.43 +.01	19.8 0.7	52.49 −.01	26.1 1.8	30.63 −.01	37.3 0.2	10.20 −.02	5.8 0.0
May 9.0	11.46 .06	19.2 0.6	52.50 +.03	24.2 2.0	30.64 +.03	37.5 0.3	10.20 +.03	5.9 +0.1
19.0	11.55 .12	18.7 0.4	52.56 .08	22.1 2.2	30.69 .08	38.0 0.5	10.25 .07	6.1 0.3
29.0	11.70 +.17	18.4 −0.2	52.66 +.12	19.9 +2.3	30.79 +.12	38.5 +0.6	10.35 +.12	6.4 +0.4
June 7.9	11.89 .21	18.2 0.0	52.80 .16	17.6 2.4	30.94 .17	39.2 0.8	10.49 .16	6.9 0.5
17.9	12.12 .25	18.3 +0.2	52.99 .20	15.2 2.4	31.13 .21	40.1 0.9	10.67 .20	7.5 0.7
27.9	12.39 .29	18.6 0.4	53.21 .23	12.8 2.3	31.35 .24	41.1 1.0	10.89 .24	8.2 0.8
July 7.9	12.70 .31	19.1 0.6	53.46 .26	10.5 2.2	31.61 .27	42.2 1.1	11.15 .27	9.1 0.9
17.8	13.02 +.33	19.8 +0.8	53.73 +.28	8.3 +2.1	31.88 +.29	43.3 +1.2	11.42 +.29	10.1 +1.0
27.8	13.36 .34	20.6 0.9	54.02 .29	6.3 1.9	32.18 .30	44.5 1.2	11.72 .30	11.1 1.0
Aug. 6.8	13.71 .35	21.6 1.1	54.31 .30	4.6 1.6	32.49 .31	45.7 1.2	12.03 .31	12.1 1.0
16.8	14.06 .35	22.7 1.2	54.61 .30	3.2 1.3	32.80 .31	46.8 1.1	12.35 .32	13.2 1.0
26.7	14.41 .34	24.0 1.2	54.91 .29	2.1 0.9	33.11 .31	47.9 1.0	12.66 .31	14.2 1.0
Sept. 5.7	14.74 +.33	25.2 +1.3	55.20 +.28	1.4 +0.5	33.41 +.30	48.9 +0.9	12.97 +.31	15.1 +0.9
15.7	15.06 .31	26.5 1.3	55.48 .27	1.1 +0.1	33.71 .29	49.7 0.8	13.28 .30	15.9 0.8
25.6	15.36 .29	27.7 1.3	55.74 .25	1.2 −0.3	33.99 .27	50.4 0.6	13.57 .29	16.6 0.7
Oct. 5.6	15.65 .27	29.0 1.2	55.99 .23	1.7 0.7	34.26 .26	50.9 0.5	13.85 .27	17.2 0.5
15.6	15.90 .24	30.2 1.2	56.20 .20	2.5 1.0	34.51 .24	51.3 0.3	14.11 .25	17.7 0.4
25.6	16.13 +.21	31.4 +1.2	56.40 +.18	3.7 −1.3	34.73 +.21	51.5 +0.2	14.35 +.23	18.1 +0.3
Nov. 4.5	16.33 .18	32.6 1.1	56.56 .15	5.1 1.5	34.94 .19	51.6 +0.1	14.56 .20	18.4 0.2
14.5	16.50 .15	33.7 1.1	56.69 .12	6.7 1.7	35.11 .16	51.7 0.0	14.75 .17	18.6 0.1
24.5	16.63 .11	34.7 1.0	56.79 .08	8.4 1.7	35.25 .13	51.6 −0.1	14.90 .14	18.7 0.1
Dec. 4.5	16.72 .07	35.6 0.9	56.86 .05	10.2 1.7	35.36 .09	51.4 0.2	15.03 .10	18.7 +0.1
14.4	16.77 +.03	36.5 +0.8	56.89 +.01	11.9 −1.7	35.43 +.05	51.3 −0.2	15.11 +.06	18.8 0.0
24.4	16.77 −.02	37.2 0.7	56.88 −.02	13.5 1.6	35.46 +.01	51.1 0.2	15.15 +.02	18.8 0.0
34.4	16.73 −.06	37.8 +0.5	56.84 −.06	15.0 −1.4	35.46 −.03	50.9 −0.2	15.15 −.02	18.8 0.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Tauri. (*Aldebaran.*)		α Camelopardalis.		ι Aurigæ.		11 Orionis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 4 29	° ′ +16 17	h m 4 43	° ′ +66 9	h m 4 49	° ′ +32 59	h m 4 58	° ′ +15 14
	s	″	s	″	s	″	s	″
(Dec.30.4)	36.58 .00	13.3 −0.2	7.84 −.06	21.9 +2.5	49.97 +.02	29.2 +0.8	17.12 +.02	58.9 −0.2
Jan. 9.4	36.55 −.04	13.2 0.2	7.72 .16	24.2 2.2	49.96 −.03	29.9 0.7	17.12 −.02	58.7 0.2
19.4	36.49 .08	13.0 0.2	7.51 .26	26.3 1.9	49.90 .08	30.6 0.6	17.08 .06	58.5 0.2
29.3	36.39 .12	12.8 0.2	7.21 .34	28.0 1.5	49.79 .13	31.1 0.5	16.99 .10	58.3 0.2
Feb. 8.3	36.25 .14	12.6 0.2	6.83 .40	29.2 1.0	49.65 .16	31.5 0.3	16.87 .13	58.2 0.1
18.3	36.10 −.16	12.5 −0.2	6.40 −.44	30.1 +0.6	49.47 −.19	31.7 +0.1	16.72 −.16	58.1 −0.1
28.2	35.93 .17	12.3 0.2	5.94 .47	30.4 +0.1	49.28 .20	31.7 −0.1	16.56 .17	58.0 0.1
Mar. 10.2	35.75 .17	12.1 0.2	5.47 .46	30.2 −0.4	49.07 .20	31.6 0.2	16.38 .18	57.9 0.1
20.2	35.58 .16	11.9 0.2	5.01 .44	29.6 0.9	48.87 .19	31.3 0.4	16.20 .17	57.8 −0.1
30.2	35.43 .14	11.8 −0.1	4.59 .39	28.5 1.3	48.68 .17	30.8 0.5	16.04 .15	57.7 0.0
Apr. 9.1	35.30 −.11	11.7 0.0	4.23 −.32	27.0 −1.6	48.53 −.14	30.2 −0.6	15.90 −.13	57.7 0.0
19.1	35.21 .07	11.7 0.0	3.95 .24	25.3 1.9	48.41 .10	29.6 0.7	15.79 .09	57.8 +0.1
29.1	35.16 −.03	11.7 +0.1	3.75 .14	23.2 2.1	48.33 −.05	28.9 0.7	15.72 .05	57.9 0.2
May 9.1	35.16 +.02	11.9 0.2	3.65 −.09	21.1 2.2	48.30 .00	28.2 0.7	15.69 −.01	58.2 0.3
19.0	35.20 .06	12.2 0.4	3.66 +.06	18.8 2.2	48.33 +.05	27.6 0.6	15.70 +.04	58.5 0.4
29.0	35.29 +.11	12.7 +0.5	3.76 +.16	16.6 −2.2	48.41 +.10	27.0 −0.5	15.76 +.08	59.0 +0.5
June 8.0	35.42 .15	13.3 0.7	3.97 .26	14.5 2.1	48.54 .15	26.6 0.4	15.87 .13	59.6 0.6
17.9	35.59 .19	14.1 0.8	4.28 .35	12.5 1.9	48.71 .20	26.3 0.2	16.02 .17	60.3 0.7
27.9	35.81 .23	14.9 0.9	4.67 .43	10.7 1.7	48.93 .24	26.1 −0.1	16.20 .20	61.1 0.8
July 7.9	36.05 .26	15.9 1.0	5.14 .50	9.2 1.4	49.19 .27	26.1 +0.1	16.42 .23	62.0 0.9
17.9	36.32 +.28	16.9 +1.0	5.68 +.56	7.9 −1.1	49.48 +.30	26.3 +0.2	16.67 +.26	62.9 +0.9
27.8	36.61 .30	18.0 1.1	6.27 .61	7.1 0.7	49.80 .32	26.6 0.3	16.94 .28	63.9 1.0
Aug. 6.8	36.91 .31	19.0 1.1	6.90 .64	6.5 −0.4	50.13 .34	27.0 0.5	17.23 .29	64.8 0.9
16.8	37.22 .31	20.1 1.0	7.55 .66	6.3 0.0	50.47 .35	27.5 0.6	17.53 .30	65.7 0.9
26.8	37.53 .31	21.1 0.9	8.23 .68	6.5 +0.4	50.82 .35	28.1 0.6	17.83 .31	66.6 0.8
Sept. 5.7	37.84 +.31	21.9 +0.8	8.91 +.67	7.0 +0.7	51.17 +.35	28.8 +0.7	18.14 +.31	67.3 +0.7
15.7	38.14 .30	22.7 0.7	9.58 .66	7.9 1.0	51.52 .34	29.5 0.7	18.45 .30	67.9 0.5
25.7	38.43 .28	23.3 0.5	10.24 .64	9.1 1.4	51.86 .33	30.3 0.8	18.75 .29	68.3 0.4
Oct. 5.6	38.71 .27	23.8 0.4	10.87 .61	10.6 1.7	52.19 .32	31.1 0.8	19.04 .28	68.6 0.2
15.6	38.97 .25	24.1 0.3	11.46 .57	12.4 1.9	52.50 .30	31.9 0.8	19.31 .27	68.8 +0.1
25.6	39.21 +.23	24.3 +0.1	12.01 +.52	14.5 +2.2	52.80 +.28	32.7 +0.8	19.57 +.25	68.8 −0.1
Nov. 4.6	39.43 .21	24.4 0.0	12.50 .46	16.7 2.4	53.07 .25	33.5 0.8	19.81 .23	68.7 0.2
14.5	39.62 .18	24.4 0.0	12.92 .38	19.2 2.6	53.30 .22	34.3 0.8	20.03 .20	68.5 0.2
24.5	39.78 .14	24.3 −0.1	13.26 .30	21.9 2.7	53.51 .18	35.2 0.9	20.22 .17	68.3 0.3
Dec. 4.5	39.91 .11	24.2 0.2	13.52 .21	24.6 2.7	53.68 .14	36.1 0.8	20.37 .14	68.0 0.3
14.5	39.99 +.06	24.1 −0.2	13.67 +.11	27.3 +2.7	53.80 +.10	36.9 +0.8	20.49 +.10	67.7 −0.3
24.4	40.04 +.03	23.9 0.2	13.73 .00	29.9 2.6	53.87 +.05	37.7 0.8	20.56 +.05	67.5 0.3
34.4	40.05 −.02	23.7 −0.2	13.68 −.10	32.4 +2.4	53.90 .00	38.5 +0.7	20.59 .00	67.2 −0.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Aurigæ. (*Capella.*)		β Orionis. (*Rigel.*)		β Tauri.		Groombridge 966.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	$5^{h}\ 8^{m}$	$+45^{\circ}\ 53'$	$5^{h}\ 9^{m}$	$-\ 8^{\circ}\ 19'$	$5^{h}\ 19^{m}$	$+28^{\circ}\ 30'$	$5^{h}\ 24^{m}$	$+74^{\circ}\ 57'$
	s	″	s	″	s	″	s	″
(Dec.30.4)	34.14 +.03	8.8 +1.5	15.39 +.02	50.3 −1.6	20.49 +.05	49.4 +0.5	63.91 .00	73.5 +2.9
Jan. 9.4	34.14 −.03	10.3 1.4	15.38 −.03	51.8 1.4	20.52 .00	49.9 0.5	63.82 −.17	76.3 2.7
19.4	34.07 .09	11.6 1.2	15.33 .07	53.1 1.2	20.49 −.05	50.4 0.5	63.57 .32	79.0 2.5
29.4	33.95 .15	12.7 1.0	15.25 .10	54.1 1.0	20.41 .10	50.9 0.4	63.18 .46	81.3 2.1
Feb. 8.3	33.78 .19	13.7 0.8	15.12 .13	55.0 0.7	20.29 .14	51.2 0.3	62.65 .58	83.2 1.7
18.3	33.57 −.23	14.3 +0.5	14.97 −.16	55.6 −0.5	20.14 −.17	51.5 +0.2	62.01 −.67	84.7 +1.2
28.3	33.33 .25	14.6 +0.2	14.80 .18	55.9 −0.2	19.96 .19	51.6 +0.1	61.30 .73	85.7 0.7
Mar.10.2	33.08 .25	14.6 −0.1	14.62 .18	56.0 0.0	19.76 .19	51.7 0.0	60.54 .76	86.1 +0.1
20.2	32.83 .25	14.4 0.4	14.44 .18	55.9 +0.3	19.57 .19	51.6 −0.2	59.79 .74	86.0 −0.4
30.2	32.59 .22	13.8 0.7	14.27 .16	55.5 0.5	19.38 .18	51.4 0.3	59.06 .70	85.4 0.9
Apr. 9.2	32.38 −.19	13.0 −0.9	14.12 −.14	54.8 +0.8	19.22 −.15	51.1 −0.3	58.40 −.62	84.2 −1.4
19.1	32.21 .14	12.0 1.1	13.99 .11	53.9 1.1	19.08 .11	50.7 0.4	57.82 .51	82.6 1.8
29.1	32.09 .09	10.9 1.2	13.90 .07	52.8 1.3	18.99 .07	50.3 0.4	57.37 .39	80.7 2.1
May 9.1	32.03 −.03	9.6 1.3	13.85 −.03	51.4 1.5	18.94 −.03	49.9 0.4	57.05 .24	78.5 2.3
19.1	32.03 +.03	8.3 1.3	13.84 +.01	49.8 1.6	18.93 +.02	49.5 0.4	56.88 −.09	76.0 2.5
29.0	32.09 +.09	7.0 −1.3	13.88 +.06	48.1 +1.8	18.98 +.07	49.2 −0.3	56.86 +.06	73.5 −2.6
June 8.0	32.22 .15	5.8 1.2	13.95 .10	46.2 1.9	19.07 .12	48.9 0.2	57.00 .21	70.9 2.5
18.0	32.40 .21	4.7 1.0	14.07 .14	44.3 2.0	19.22 .16	48.7 −0.1	57.29 .36	68.4 2.5
27.9	32.63 .26	3.7 0.9	14.23 .17	42.3 2.0	19.40 .20	48.7 0.0	57.72 .50	66.0 2.3
July 7.9	32.91 .30	2.9 0.7	14.42 .21	40.2 2.0	19.62 .24	48.8 +0.1	58.29 .62	63.8 2.1
17.9	33.23 +.34	2.3 −0.5	14.64 +.23	38.3 +1.9	19.88 +.27	48.9 +0.2	58.97 +.73	61.8 −1.8
27.9	33.58 .37	1.9 0.3	14.88 .25	36.4 1.8	20.16 .29	49.2 0.3	59.76 .83	60.2 1.5
Aug. 6.8	33.96 .39	1.6 −0.1	15.15 .27	34.7 1.5	20.47 .31	49.5 0.4	60.63 .91	58.8 1.2
16.8	34.36 .40	1.6 +0.1	15.42 .28	33.3 1.3	20.78 .32	49.9 0.4	61.57 .97	57.8 0.8
26.8	34.77 .41	1.8 0.3	15.71 .29	32.1 1.0	21.11 .33	50.3 0.4	62.56 1.01	57.2 −0.4
Sept. 5.8	35.19 +.42	2.1 +0.4	16.00 +.29	31.3 +0.7	21.45 +.34	50.8 +0.4	63.58+1.03	57.0 0.0
15.7	35.60 .41	2.6 0.6	16.29 .29	30.8 +0.3	21.79 .33	51.2 0.4	64.62 1.04	57.2 +0.4
25.7	36.02 .41	3.3 0.8	16.58 .28	30.7 −0.1	22.12 .33	51.6 0.4	65.66 1.03	57.8 0.8
Oct. 5.7	36.42 .39	4.1 0.9	16.85 .27	31.0 0.4	22.45 .32	52.1 0.4	66.68 1.00	58.8 1.2
15.6	36.80 .37	5.1 1.1	17.12 .26	31.6 0.8	22.76 .31	52.5 0.4	67.67 .95	60.1 1.6
25.6	37.17 +.35	6.2 +1.2	17.37 +.24	32.5 −1.1	23.07 +.29	52.9 +0.4	68.59 +.89	61.9 +1.9
Nov. 4.6	37.50 .32	7.5 1.3	17.60 .22	33.7 1.3	23.35 .27	53.3 0.4	69.44 .80	64.0 2.2
14.6	37.81 .28	8.9 1.4	17.81 .19	35.2 1.5	23.61 .24	53.7 0.4	70.19 .70	66.3 2.5
24.5	38.07 .24	10.3 1.5	17.98 .16	36.8 1.6	23.84 .21	54.1 0.4	70.83 .57	69.0 2.7
Dec. 4.5	38.29 .19	11.9 1.5	18.13 .13	38.5 1.7	24.03 .17	54.6 0.5	71.34 .43	71.8 2.9
14.5	38.45 +.13	13.4 +1.6	18.24 +.09	40.2 −1.7	24.18 +.13	55.0 +0.5	71.70 +.28	74.8 +3.0
24.5	38.55 .07	15.0 1.5	18.30 +.04	41.8 1.6	24.29 .08	55.6 0.5	71.89 +.11	77.8 3.0
34.4	38.60 +.01	16.5 +1.4	18.33 .00	43.4 −1.5	24.34 +.03	56.0 +0.5	71.92 −.06	80.7 +2.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Orionis.		α Leporis.		ε Orionis.		α Columbæ.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	$5^{h}\ 26^{m}$	$-\ 0^{\circ}\ 22'$	$5^{h}\ 27^{m}$	$-17^{\circ}\ 53'$	$5^{h}\ 30^{m}$	$-\ 1^{\circ}\ 16'$	$5^{h}\ 35^{m}$	$-34^{\circ}\ 7'$
	s	″	s	″	s	″	s	″
(Dec.30.4)	23.48 +.04	55.6 −1.2	53.19 +.02	70.5 −2.1	38.18 +.04	25.2 −1.3	40.86 +.01	65.3 −2.8
Jan. 9.4	23.49 −.01	56.7 1.1	53.19 −.02	72.5 1.9	38.20 .00	26.4 1.1	40.84 −.05	68.0 2.5
19.4	23.47 .05	57.7 0.9	53.15 .07	74.3 1.6	38.17 −.05	27.4 1.0	40.77 .10	70.3 2.2
29.4	23.40 .09	58.5 0.7	53.06 .11	75.8 1.3	38.10 .09	28.3 0.8	40.65 .14	72.4 1.8
Feb. 8.3	23.29 .12	59.2 0.6	52.93 .14	77.0 1.0	38.00 .12	29.0 0.6	40.48 .18	74.0 1.4
18.3	23.15 −.15	59.7 −0.4	52.78 −.17	77.9 −0.7	37.86 −.15	29.6 −0.4	40.28 −.21	75.2 −1.0
28.3	22.99 .17	60.0 −0.2	52.60 .19	78.4 −0.4	37.70 .17	29.9 −0.2	40.06 .23	76.0 0.6
Mar. 10.3	22.82 .17	60.1 0.0	52.40 .19	78.6 0.0	37.53 .18	30.0 0.0	39.82 .24	76.3 −0.1
20.2	22.64 .17	60.0 +0.2	52.21 .19	78.5 +0.3	37.35 .17	30.0 +0.1	39.58 .24	76.2 +0.3
30.2	22.47 .16	59.8 0.3	52.02 .18	78.0 0.6	37.18 .16	29.7 0.3	39.34 .23	75.6 0.8
Apr. 9.2	22.32 −.14	59.4 +0.5	51.84 −.16	77.2 +0.9	37.03 −.14	29.3 +0.5	39.12 −.21	74.7 +1.2
19.2	22.19 .11	58.8 0.7	51.69 .13	76.2 1.2	36.90 .11	28.7 0.7	38.93 .18	73.2 1.6
29.1	22.10 .08	58.0 0.9	51.58 .10	74.8 1.5	36.80 .08	27.9 0.9	38.77 .14	71.5 2.0
May 9.1	22.04 −.04	57.0 1.0	51.50 .06	73.1 1.8	36.74 −.04	26.9 1.1	38.65 .10	69.3 2.3
19.1	22.02 .00	55.9 1.2	51.46 −.01	71.2 2.0	36.71 .00	25.7 1.2	38.57 −.05	66.9 2.5
29.0	22.05 +.05	54.7 +1.3	51.47 +.03	69.1 +2.2	36.74 +.04	24.4 +1.4	38.55 .00	64.2 +2.8
June 8.0	22.12 .09	53.3 1.4	51.52 .07	66.8 2.3	36.80 .08	23.0 1.5	38.57 +.04	61.4 2.9
18.0	22.22 .13	51.8 1.5	51.61 .11	64.5 2.4	36.90 .12	21.5 1.6	38.63 .09	58.4 3.0
28.0	22.37 .16	50.2 1.6	51.75 .15	62.0 2.4	37.05 .16	19.8 1.6	38.75 .14	55.4 3.0
July 7.9	22.55 .20	48.6 1.6	51.92 .19	59.6 2.4	37.22 .19	18.2 1.6	38.90 .18	52.4 2.9
17.9	22.77 +.23	47.0 +1.5	52.12 +.22	57.3 +2.3	37.43 +.22	16.6 +1.6	39.10 +.21	49.6 +2.8
27.9	23.00 .25	45.5 1.4	52.35 .24	55.1 2.1	37.67 .24	15.1 1.5	39.33 .24	46.9 2.5
Aug. 6.8	23.26 .26	44.1 1.3	52.60 .26	53.2 1.8	37.92 .26	13.7 1.3	39.59 .27	44.5 2.2
16.8	23.53 .28	42.9 1.1	52.87 .28	51.5 1.5	38.19 .27	12.4 1.1	39.88 .29	42.5 1.8
26.8	23.81 .28	41.9 0.9	53.16 .27	50.2 1.1	38.47 .28	11.4 0.9	40.18 .31	40.9 1.3
Sept. 5.8	24.10 +.29	41.1 +0.6	53.45 +.29	49.2 +0.7	38.76 +.29	10.6 +0.6	40.49 +.32	39.8 +0.8
15.7	24.39 .29	40.6 +0.3	53.74 .29	48.7 +0.3	39.05 .29	10.1 +0.3	40.81 .32	39.3 +0.3
25.7	24.68 .29	40.5 0.0	54.04 .29	48.7 −0.2	39.34 .29	10.0 0.0	41.14 .32	39.3 −0.3
Oct. 5.7	24.97 .28	40.6 −0.3	54.32 .28	49.0 0.6	39.62 .28	10.1 −0.3	41.45 .31	39.8 0.8
15.7	25.24 .27	41.0 0.6	54.60 .27	49.9 1.0	39.90 .27	10.5 0.6	41.76 .30	40.9 1.3
25.6	25.50 +.25	41.7 −0.8	54.87 +.25	51.1 −1.4	40.16 +.26	11.3 −0.8	42.05 +.28	42.5 −1.8
Nov. 4.6	25.75 .23	42.6 1.0	55.11 .23	52.7 1.7	40.41 .24	12.2 1.0	42.31 .25	44.6 2.2
14.6	25.98 .21	43.7 1.2	55.33 .20	54.6 2.0	40.64 .21	13.4 1.2	42.54 .22	47.0 2.6
24.5	26.17 .18	44.9 1.3	55.52 .17	56.7 2.1	40.84 .19	14.7 1.3	42.74 .18	49.7 2.8
Dec. 4.5	26.34 .15	46.2 1.3	55.68 .14	58.9 2.2	41.01 .15	16.0 1.4	42.90 .14	52.6 2.9
14.5	26.47 +.11	47.5 −1.3	55.79 +.10	61.1 −2.2	41.14 +.11	17.4 −1.4	43.01 +.09	55.5 −2.9
24.5	26.56 .07	48.8 1.2	55.87 +.05	63.3 2.1	41.24 .07	18.8 1.3	43.08 +.04	58.4 2.8
34.4	26.61 +.02	50.0 −1.1	55.90 .00	65.4 −2.0	41.29 +.03	20.0 −1.2	43.09 −.01	61.1 −2.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α* Orionis.		*ν* Orionis.		22 Camelop. (H.)		*μ* Geminorum.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	$5^{h}\ 49^{m}$	$+\ 7^{\circ}\ 23'$	$6^{h}\ 1^{m}$	$+14^{\circ}\ 46'$	$6^{h}\ 6^{m}$	$+69^{\circ}\ 21'$	$6^{h}\ 16^{m}$	$+22^{\circ}\ 34'$
	s	″	s	″	s	″	s	″
(Dec.30.5)	13.24 +.07	7.1 −0.8	17.78 +.08	49.8 −0.4	44.81 +.14	26.8 +2.7	18.62 +.10	8.3 0.0
Jan. 9.5	13.28 +.02	6.4 0.7	17.84 +.03	49.4 0.3	44.88 +.01	29.5 2.6	18.70 +.05	8.4 +0.1
19.4	13.28 −.03	5.7 0.6	17.85 −.02	49.2 0.2	44.84 −.11	32.2 2.5	18.73 .00	8.6 0.2
29.4	13.23 .07	5.2 0.5	17.82 .06	49.0 0.1	44.66 .23	34.6 2.3	18.71 −.05	8.8 0.2
Feb. 8.4	13.14 .11	4.8 0.4	17.74 .10	48.9 −0.1	44.38 .33	36.7 2.0	18.63 .09	9.1 0.3
18.3	13.02 −.14	4.5 −0.2	17.62 −.13	48.8 0.0	43.99 −.42	38.5 +1.6	18.52 −.13	9.3 +0.3
28.3	12.87 .16	4.3 −0.1	17.47 .16	48.8 0.0	43.53 .49	39.9 1.1	18.37 .16	9.6 0.2
Mar. 10.3	12.70 .17	4.2 0.0	17.30 .17	48.9 +0.1	43.02 .53	40.8 0.7	18.20 .18	9.8 0.2
20.3	12.52 .17	4.3 +0.1	17.13 .18	49.0 0.1	42.48 .54	41.2 +0.2	18.02 .18	10.0 0.2
30.2	12.35 .17	4.4 0.2	16.95 .17	49.1 0.1	41.94 .52	41.1 −0.3	17.84 .18	10.1 +0.1
Apr. 9.2	12.19 −.15	4.6 +0.3	16.78 −.15	49.2 +0.1	41.43 −.49	40.5 −0.8	17.66 −.16	10.2 0.0
19.2	12.05 .12	5.0 0.4	16.64 .13	49.4 0.2	40.97 .42	39.5 1.2	17.51 .14	10.2 0 0
29.2	11.95 .09	5.4 0.5	16.53 .10	49.6 0.2	40.59 .34	38.1 1.6	17.36 .11	10.2 0.0
May 9.1	11.87 .05	6.0 0.6	16.45 .06	49.8 0.3	40.29 .25	36.3 1.9	17.29 .07	10.2 0.0
19.1	11.84 − 01	6.7 0.7	16.41 −.02	50.2 0.4	40.09 .14	34.2 2.1	17.24 −.03	10.1 0.0
29.1	11.86 +.03	7.5 +0.9	16.42 +.02	50.6 +0.4	40.00 −.03	32.0 −2.3	17.23 +.02	10.1 0.0
June 8.0	11.91 .07	8.4 1.0	16.46 .07	51.0 0.5	40.02 +.08	29.7 2.4	17.27 .06	10.1 0.0
18.0	12.00 .11	9.4 1.0	16.55 .11	51.6 0.6	40.16 .19	27.3 2.4	17.35 .10	10.2 +0.1
28.0	12.14 .15	10.5 1.1	16.68 .15	52.2 0.6	40.40 .29	24.9 2.3	17.47 .14	10.3 0.1
July 8.0	12.31 .18	11.6 1.1	16.85 .18	52.8 0.7	40.74 .39	22.6 2.2	17.63 .18	10.4 0.2
17.9	12.51 +.21	12.7 +1.1	17.05 +.21	53.5 +0.7	41.18 +.48	20.5 −2.0	17.83 +.21	10.6 +0 2
27.9	12.73 .24	13 8 1.1	17.27 .24	54.2 0.7	41.70 .56	18.6 1.8	18.05 .24	10.8 0.2
Aug. 6.9	12.98 .26	14.9 1.0	17.52 .26	54.8 0.6	42.30 .62	16.9 1.5	18.31 .26	11.0 0.2
16 9	13.25 .27	15.8 0.8	17.79 .28	55.4 0.5	42.95 .68	15.5 1.3	18.58 .28	11.1 0.2
26.8	13.53 .28	16.5 0.7	18.07 .29	55.9 0.4	43.66 .72	14.4 1.0	18.87 .30	11.3 0.1
Sept. 5.8	13.82 +.29	17.1 +0.5	18.37 +.30	56.3 +0.3	44.40 +.76	13.6 −0.6	19.17 +.31	11.4 +0.1
15.8	14.11 .29	17.5 +0.3	18.67 .30	56.6 +0.2	45.17 .78	13.2 −0.3	19.49 .32	11.5 0.0
25.7	14.41 .30	17.7 0.0	18.97 .31	56.6 0.0	45.96 .79	13.1 +0.1	19.81 .32	11.4 −0.1
Oct. 5.7	14.70 .29	17.6 −0.2	19.28 .31	56.6 −0.1	46.75 .78	13.3 0.5	20.13 .32	11.3 0.1
15.7	14.99 .29	17.3 0.4	19.59 .30	56.4 0.3	47.52 .77	14.0 0.8	20.45 .32	11.1 0.2
25.7	15.27 +.28	16.8 −0.6	19.88 +.29	56.1 −0.4	48.28 +.73	15.0 +1.2	20.77 +.31	10.9 −0.2
Nov. 4.6	15.54 .26	16.1 0.7	20.17 .28	55.6 0.5	48.99 .69	16.4 1.5	21.08 .30	10.7 0.3
14.6	15.79 .24	15.3 0.8	20.43 .26	55.1 0.5	49.65 .63	18.1 1.9	21.37 .28	10.4 0.3
24.6	16.02 .21	14.4 0.9	20.68 .23	54.5 0.6	50.24 .55	20.1 2.2	21.64 .25	10.2 0.2
Dec. 4.6	16.21 .18	13.5 0.9	20.89 .20	54.0 0.5	50.75 .45	22.4 2.4	21.88 .22	10.0 0.2
14.5	16.37 +.14	12 6 −0.9	21.07 +.16	53.4 −0.5	51.15 +.35	24.9 +2.6	22.08 +.18	9.8 −0.1
24.5	16.49 .10	11.7 0.9	21.21 .12	52.9 0.4	51.44 .23	27.5 2.7	22.25 .14	9.8 0.0
34.5	16.56 +.05	10.8 −0.8	21.30 +.07	52.5 −0.3	51.60 +.09	30.2 +2.7	22.36 +.09	9.8 +0.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Argûs. (*Canopus*.)		γ Geminorum.		α Canis Majoris. (*Sirius*.)		ε Canis Majoris.	
	Right Ascension.	Declination *South*.	Right Ascension.	Declination *North*.	Right Ascension.	Declination *South*.	Right Ascension.	Declination *South*.
	$6^{h}\ 21^{m}$	$-52^{\circ}\ 37'$	$6^{h}\ 31^{m}$	$+16^{\circ}\ 29'$	$6^{h}\ 40^{m}$	$-16^{\circ}\ 33'$	$6^{h}\ 54^{m}$	$-28^{\circ}\ 49'$
	s	″	s	″	s	″	s	″
(Dec.30.5)	32.48 +.01	70.7 −3.5	21.70 +.11	31.8 −0.4	18.69 +.09	58.1 −2.3	18.95 +.09	22.2 −2.9
Jan. 9.5	32.46 −.06	74.1 3.2	21.78 .06	31.4 0.3	18.76 +.04	60.3 2.2	19.02 +.01	25.1 2.7
19.4	32.36 .13	77.2 2.9	21.82 +.01	31.2 0.2	18.78 .00	62.4 2.0	19.04 −.01	27.7 2.5
29.4	32.20 .19	80.0 2.6	21.81 −.03	31.1 −0.1	18.75 −.05	64.3 1.7	19.00 .06	30.1 2.3
Feb. 8.4	31.98 .25	82.4 2.2	21.76 .08	31.1 0.0	18.68 .09	65.9 1.4	18.92 .11	32.3 2.0
18.4	31.71 −.29	84.4 −1.7	21.66 −.12	31.2 +0.1	18.56 −.13	67.2 −1.0	18.79 −.15	34.0 −1.6
28.3	31.40 .33	85.9 1.2	21.52 .15	31.3 0.1	18.41 .16	68.1 0.8	18.62 .18	35.4 1.2
Mar. 10.3	31.05 .35	86.9 0.7	21.36 .17	31.4 0.2	18.24 .18	68.8 0.5	18.43 .20	36.4 0.8
20.3	30.69 .36	87.3 −0.2	21.19 .18	31.6 0.2	18.05 .19	69.1 −0.2	18.22 .22	37.0 −0.4
30.3	30.33 .36	87.3 +0.3	21.01 .17	31.8 0.2	17.86 .19	69.1 +0.2	18.00 .22	37.2 0.0
Apr. 9.2	29.98 −.34	86.7 +0.8	20.84 −.16	31.9 +0.2	17.67 −.18	68.8 +0.5	17.78 −.21	37.0 +0.4
19.2	29.65 .31	85.6 1.3	20.69 .14	32.1 0.2	17.50 .16	68.2 0.8	17.57 .19	36.4 0.8
29.2	29.36 .28	84.0 1.8	20.56 .11	32.3 0.2	17.35 .14	67.3 1.1	17.39 .17	35.4 1.2
May 9.1	29.10 .23	82.0 2.2	20.46 .08	22.6 0.2	17.22 .11	66.1 1.3	17.23 .14	34.0 1.5
19.1	28.89 .18	79.7 2.5	20.40 −.04	32.8 0.3	17.13 .07	64.6 1.6	17.11 .10	32.3 1.8
29.1	28.74 −.12	76.9 +2.8	20.38 .00	33.1 +0.3	17.08 −.03	63.0 +1.8	17.02 −.07	30.3 +2.1
June 8.1	28.65 −.06	73.9 3.1	20.40 +.04	33.4 0.4	17.07 +.01	61.1 1.9	16.98 −.03	28.1 2.3
18.0	28.62 .00	70.8 3.2	20.47 .08	33.8 0.4	17.09 .05	59.1 2.0	16.97 +.02	25.6 2.5
28.0	28.64 +.06	67.4 3.3	20.57 .12	34.2 0.4	17.16 .09	57.0 2.1	17.01 .06	23.0 2.6
July 8.0	28.73 .12	64.1 3.3	20.71 .16	34.6 0.4	17.26 .12	54.8 2.1	17.09 .10	20.4 2.6
18.0	28.88 +.17	60.8 +3.2	20.88 +.19	35.1 +0.4	17.40 +.15	52.7 +2.1	17.20 +.13	17.7 +2.6
27.9	29.08 .23	57.7 3.0	21.09 .22	35.5 0.4	17.57 .18	50.6 2.0	17.36 .17	15.2 2.5
Aug. 6.9	29.33 .27	54.8 2.7	21.31 .24	36.0 0.4	17.77 .21	48.7 1.8	17.54 .20	12.8 2.3
16.9	29.63 .32	52.2 2.3	21.57 .26	36.3 0.3	17.99 .23	47.0 1.5	17.76 .23	10.7 2.0
26.8	29.96 .35	50.1 1.9	21.84 .28	36.6 0.2	18.23 .25	45.6 1.2	18.00 .25	8.8 1.6
Sept. 5.8	30.33 +.38	48.5 +1.3	22.12 +.29	36.8 +0.1	18.50 +.27	44.6 +0.9	18.27 +.28	7.4 +1.2
15.8	30.72 .40	47.5 0.7	22.42 .30	36.8 0.0	18.77 .28	43.9 +0.5	18.55 .29	6.4 0.7
25.8	31.13 .41	47.1 +0.1	22.73 .31	36.7 −0.2	19.06 .29	43.7 0.0	18.85 .31	6.0 +0.2
Oct. 5.7	31.54 .41	47.3 −0.5	23.04 .31	36.5 0.3	19.36 .30	43.9 −0.4	19.16 .31	6.1 −0.3
15.7	31.94 .40	48.2 1.2	23.35 .31	36.2 0.4	19.65 .30	44.5 0.9	19.48 .31	6.7 0.9
25.7	32.33 +.38	49.7 −1.8	23.66 +.31	35.7 −0.5	19.95 +.29	45.6 −1.3	19.79 +.31	7.8 −1.4
Nov. 4.7	32.69 .35	51.7 2.3	23.96 .30	35.1 0.6	20.24 .28	47.1 1.6	20.10 .30	9.4 1.8
14.6	33.02 .30	54.3 2.8	24.25 .28	34.5 0.6	20.51 .26	48.9 1.9	20.39 .28	11.4 2.2
24.6	33.30 .25	57.3 3.1	24.52 .26	33.9 0.6	20.76 .24	51.0 2.2	20.66 .25	13.8 2.5
Dec. 4.6	33.53 .19	60.5 3.3	24.77 .23	33.3 0.6	20.98 .21	53.3 2.3	20.90 .22	16.5 2.8
14.5	33.69 +.13	63.9 −3.5	24.98 +.19	32.7 −0.5	21.17 +.17	55.6 −2.4	21.09 +.18	19.3 −2.9
24.5	33.79 +.06	67.4 3.5	25.15 .15	32.2 0.4	21.32 .12	58.0 2.4	21.25 .13	22.2 2.9
34.5	33.81 −.01	70.9 −3.4	25.27 +.10	31.8 −0.3	21.42 +.08	60.4 −2.3	21.36 +.08	25.1 −2.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Canis Majoris.		δ Geminorum.		Piazzi vii. 67.		α^2 Geminorum. (*Castor.*)	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	$7^{\mathrm{h}}\ 3^{\mathrm{m}}$	$-26^{\circ}\ 12'$	$7^{\mathrm{h}}\ 13^{\mathrm{m}}$	$+22^{\circ}\ 10'$	$7^{\mathrm{h}}\ 19^{\mathrm{m}}$	$+68^{\circ}\ 41'$	$7^{\mathrm{h}}\ 27^{\mathrm{m}}$	$+32^{\circ}\ 7'$
	s	″	s	″	s	″	s	″
(Dec.30.5)	55.81 +.11	67.2 −2.8	33.46 +.16	61.8 −0.2	27.51 +.24	18.7 +2.4	35.19 +.19	43.3 +0.4
Jan. 9.5	55.89 .06	69.9 2.7	33.60 .11	61.7 0.0	27.78 .21	21.3 2.6	35.36 .14	43.7 0.6
19.5	55.92 +.01	72.5 2.5	33.68 .06	61.8 +0.1	27.93 +.08	23.9 2.6	35.47 .08	44.4 0.7
29.4	55.90 −.04	74.9 2.2	33.71 +.01	61.9 0.2	27.95 −.04	26.5 2.6	35.52 +.02	45.2 0.8
Feb. 8.4	55.83 .09	77.0 1.9	33.69 −.04	62.2 0.3	27.84 .16	29.1 2.5	35.51 −.04	46.0 0.9
18.4	55.72 −.13	78.8 −1.6	33.63 −.09	62.6 +0.4	27.62 −.27	31.5 +2.2	35.45 −.09	46.9 +0.9
28.4	55.57 .17	80.2 1.2	33.52 .13	63.0 0.4	27.29 .36	33.5 1.9	35.34 .13	47.8 0.8
Mar. 10.3	55.38 .19	81.2 0.8	33.37 .15	63.4 0.4	26.89 .44	35.3 1.5	35.19 .16	48.6 0.7
20.3	55.18 .20	81.8 −0.4	33.21 .17	63.8 0.4	26.42 .48	36.5 1.0	35.01 .18	49.3 0.6
30.3	54.97 .21	82.1 0.0	33.03 .18	64.2 0.3	25.92 .50	37.3 0.6	34.82 .19	49.8 0.5
Apr. 9.3	54.76 −.20	81.9 +0.3	32.85 −.17	64.5 +0.3	25.41 −.50	37.6 +0.1	34.63 −.19	50.2 +0.3
19.2	54.56 .19	81.4 0.7	32.68 .16	64.7 0.2	24.92 .47	37.5 −0.4	34.44 .18	50.5 +0.2
29.2	54.38 .17	80.5 1.1	32.53 .13	64.9 0.2	24.46 .43	36.8 0.9	34.27 .16	50.5 0.0
May 9.2	54.23 .14	79.2 1.4	32.41 .11	65.1 0.1	24.07 .36	35.7 1.3	34.13 .13	50.4 −0.2
19.1	54.11 .10	77.6 1.7	32.32 .07	65.1 +0.1	23.75 .28	34.3 1.6	34.02 .09	50.2 0.3
29.1	54.02 −.07	75.8 +2.0	32.27 −.03	65.2 0.0	23.51 −.19	32.5 −1.9	33.95 −.05	49.9 −0.4
June 8.1	53.97 −.03	73.7 2.2	32.26 +.01	65.2 0.0	23.37 −.09	30.4 2.2	33.92 −.01	49.4 0.5
18.1	53.96 +.01	71.4 2.4	32.28 .05	65.2 0.0	23.32 +.01	28.1 2.4	33.94 +.04	48.9 0.6
28.0	53.99 .05	68.9 2.5	32.35 .08	65.2 0.0	23.38 .11	25.7 2.5	33.99 .09	48.3 0.6
July 8.0	54.06 .09	66.4 2.5	32.45 .12	65.1 0.0	23.54 .20	23.2 2.5	34.09 .12	47.6 0.7
18.0	54.17 +.13	63.9 +2.5	32.59 +.16	65.1 0.0	23.79 +.30	20.7 −2.5	34.23 +.15	47.0 −0.7
28.0	54.32 .16	61.4 2.4	32.77 .19	65.0 −0.1	24.13 .39	18.2 2.4	34.40 .19	46.3 0.7
Aug. 6.9	54.49 .19	59.1 2.2	32.97 .21	64.9 0.1	24.56 .47	15.8 2.3	34.60 .22	45.6 0.7
16.9	54.70 .22	57.1 1.9	33.20 .24	64.8 0.2	25.07 .54	13.6 2.1	34.84 .25	44.8 0.7
26.9	54.93 .24	55.3 1.6	33.45 .26	64.6 0.2	25.64 .60	11.6 1.9	35.10 .27	44.1 0.7
Sept. 5.8	55.19 +.27	53.9 +1.2	33.72 +.28	64.3 −0.3	26.27 +.66	9.8 −1.6	35.39 +.30	43.4 −0.8
15.8	55.47 .29	53.0 0.7	34.01 .30	64.0 0.4	26.95 .70	8.3 1.4	35.70 .32	42.6 0.8
25.8	55.76 .30	52.5 +0.2	34.32 .31	63.5 0.5	27.67 .74	7.1 1.1	36.03 .33	41.8 0.8
Oct. 5.8	56.06 .31	52.5 −0.3	34.64 .32	63.0 0.6	28.42 .76	6.2 0.7	36.37 .35	41.1 0.7
15.7	56.37 .31	53.1 0.8	34.96 .33	62.4 0.6	29.19 .77	5.7 −0.3	36.72 .36	40.3 0.7
25.7	56.69 +.31	54.1 −1.3	35.29 +.33	61.7 −0.7	29.97 +.77	5.6 +0.1	37.08 +.36	39.7 −0.6
Nov. 4.7	56.99 .30	55.7 1.7	35.62 .33	61.1 0.7	30.74 .76	5.9 0.5	37.45 .36	39.1 0.5
14.7	57.29 .28	57.6 2.1	35.95 .32	60.4 0.7	31.48 .72	6.6 0.9	37.80 .35	38.6 0.4
24.6	57.56 .26	60.0 2.4	36.26 .30	59.7 0.6	32.18 .67	7.6 1.3	38.15 .33	38.2 0.3
Dec. 4.6	57.80 .23	62.5 2.7	36.54 .27	59.2 0.5	32.82 .60	9.1 1.7	38.47 .31	38.0 −0.1
14.6	58.01 +.19	65.3 −2.8	36.80 +.24	58.7 −0.4	33.39 +.51	11.0 +2.0	38.76 +.27	38.0 +0.1
24.5	58.18 .14	68.1 2.8	37.02 .20	58.4 0.3	33.85 .41	13.2 2.3	39.01 .23	38.2 0.3
34.5	58.30 +.10	70.9 −2.8	37.19 +.15	58.2 −0.1	34.21 +.29	15.6 +2.5	39.21 +.17	38.6 +0.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Canis Minoris. (*Procyon.*)		β Geminorum. (*Pollux.*)		φ Geminorum.		3 Ursæ Majoris (H.)	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 7 33	° ′ + 5 30	h m 7 38	° ′ +28 17	h m 7 46	° ′ +27 2	h m 8 1	° ′ +68 47
	s	″	s	″	s	″	s	″
(Dec. 30.5)	32.92 +.16	23.6 −1.3	35.32 +.20	26.6 +0.1	46.13 +.20	58.0 0.0	53.23 +.44	43.8 +2.2
Jan. 9.5	33.06 .12	22.3 1.1	35.49 .14	26.8 0.3	46.31 .15	58.1 +0.2	53.62 .32	46.1 2.4
19.5	33.15 .07	21.3 1.0	35.61 .09	27.2 0.4	46.44 .10	58.4 0.4	53.88 .20	48.6 2.6
29.5	33.19 +.02	20.4 0.8	35.67 +.03	27.7 0.6	46.50 +.04	58.8 0.5	54.01 +.07	51.3 2.7
Feb. 8.4	33.18 −.03	19.7 0.6	35.67 −.02	28.4 0.7	46.52 −.01	59.4 0.6	54.01 −.06	54.0 2.6
18.4	33.13 −.07	19.2 −0.4	35.62 −.07	29.1 +0.7	46.48 −.06	60.0 +0.7	53.89 −.18	56.5 +2.5
28.4	33.04 .11	18.9 0.3	35.53 .11	29.8 0.7	46.39 .11	60.7 0.7	53.65 .29	58.9 2.3
Mar. 10.3	32.91 .14	18.7 −0.1	35.39 .14	30.6 0.7	46.26 .14	61.4 0.7	53.32 .37	61.0 1.9
20.3	32.76 .16	18.7 0.0	35.23 .17	31.2 0.6	46.11 .16	62.1 0.6	52.91 .44	62.8 1.5
30.3	32.60 .17	18.8 +0.2	35.05 .18	31.8 0.5	45.93 .18	62.7 0.5	52.44 .48	64.1 1.1
Apr. 9.3	32.43 −.16	19.0 +0.3	34.86 −.18	32.2 +0.4	45.75 −.18	63.1 +0.4	51.95 −.50	64.9 +0.6
19.2	32.27 .15	19.3 0.4	34.68 .17	32.6 0.2	45.58 .17	63.5 0.3	51.45 .49	65.3 +0.1
29.2	32.12 .14	19.7 0.5	34.52 .15	32.7 +0.1	45.41 .16	63.8 0.2	50.97 .46	65.1 −0.4
May 9.2	32.00 .11	20.2 0.6	34.38 .13	32.8 0.0	45.27 .13	63.9 +0.1	50.52 .42	64.5 0.8
19.2	31.90 .08	20.8 0.6	34.27 .09	32.7 −0.1	45.16 .10	63.9 0.0	50.14 .35	63.4 1.3
29.1	31.83 −.05	21.5 +0.7	34.19 −.05	32.5 −0.2	45.08 −.06	63.8 −0.1	49.83 −.27	62.0 −1.7
June 8.1	31.80 −.01	22.3 0.8	34.16 −.01	32.3 0.3	45.04 −.02	63.6 0.2	49.60 .18	60.1 2.0
18.1	31.80 +.02	23.1 0.8	34.16 +.02	32.0 0.4	45.04 +.02	63.4 0.3	49.46 −.09	58.0 2.2
28.0	31.84 .05	23.9 0.8	34.20 .06	31.6 0.4	45.08 .06	63.1 0.3	49.41 .00	55.7 2.4
July 8.0	31.91 .09	24.8 0.9	34.28 .10	31.2 0.4	45.15 .09	62.7 0.4	49.46 +.10	53.2 2.6
18.0	32.02 +.12	25.6 +0.8	34.40 +.14	30.7 −0.5	45.26 +.13	62.2 −0.5	49.60 +.19	50.5 −2.6
28.0	32.15 .15	26.4 0.8	34.56 .17	30.2 0.5	45.41 .16	61.8 0.5	49.84 .28	47.9 2.6
Aug. 6.9	32.32 .18	27.1 0.7	34.74 .20	29.6 0.6	45.59 .19	61.3 0.5	50.16 .37	45.2 2.6
16.9	32.50 .20	27.7 0.5	34.96 .23	29.0 0.6	45.79 .22	60.7 0.6	50.57 .45	42.7 2.5
26.9	32.72 .22	28.2 0.3	35.20 .26	28.4 0.7	46.03 .25	60.0 0.7	51.05 .52	40.2 2.4
Sept. 5.9	32.95 +.24	28.4 +0.1	35.47 +.28	27.7 −0.7	46.28 +.27	59.4 −0.7	51.61 +.58	37.9 −2.2
15.8	33.21 .26	28.4 −0.1	35.76 .30	27.0 0.8	46.57 .29	58.6 0.8	52.22 .64	35.8 1.9
25.8	33.48 .28	28.2 0.3	36.07 .32	26.2 0.8	46.87 .31	57.8 0.8	52.89 .69	34.0 1.7
Oct. 5.8	33.77 .29	27.8 0.6	36.39 .33	25.4 0.8	47.19 .33	57.0 0.9	53.61 .73	32.5 1.4
15.7	34.07 .30	27.1 0.8	36.73 .34	24.6 0.8	47.53 .34	56.1 0.9	54.36 .76	31.3 1.0
25.7	34.37 +.31	26.1 −1.0	37.08 +.35	23.8 −0.8	47.87 +.35	55.2 −0.9	55.13 +.78	30.5 −0.6
Nov. 4.7	34.68 .31	25.0 1.2	37.43 .35	23.0 0.7	48.22 .35	54.3 0.8	55.91 .78	30.1 −0.2
14.7	34.99 .30	23.7 1.4	37.78 .34	22.3 0.6	48.57 .34	53.5 0.7	56.69 .76	30.2 +0.3
24.6	35.28 .28	22.3 1.4	38.12 .33	21.7 0.5	48.91 .33	52.8 0.6	57.44 .73	30.7 0.7
Dec. 4.6	35.55 .26	20.8 1.5	38.44 .31	21.2 0.4	49.23 .31	52.2 0.5	58.15 .68	31.6 1.2
14.6	35.80 +.23	19.4 −1.4	38.73 +.27	20.9 −0.2	49.52 +.28	51.8 −0.3	58.79 +.60	33.0 +1.6
24.6	36.02 .19	18.0 1.4	38.98 .23	20.8 0.0	49.78 .24	51.6 −0.1	59.35 .51	34.8 1.9
34.5	36.19 +.15	16.7 −1.3	39.18 +.18	20.9 +0.2	50.00 +.19	51.5 +0.1	59.81 +.40	36.9 +2.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	15 Argûs (ρ)		η Cancri.		ε Hydræ.		ι Ursæ Majoris.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 8 2	° ′ −23 59	h m 8 26	° ′ +20 48	h m 8 40	° ′ + 6 49	h m 8 51	° ′ +48 28
	s	″	s	″	s	″	s	″
(Dec.30.6	52.11 +.17	10.8 −2.8	21.00 +.23	50.1 −0.5	57.17 +.23	19.9 −1.4	40.73 +.34	17.3 +0.8
Jan. 9.5	52.25 .12	13.6 2.7	21.21 .18	49.7 0.3	57.37 .18	18.6 1.3	41.03 .27	18.2 1.1
19.5	52.35 .07	16.3 2.6	21.37 .13	49.4 −0.1	57.53 .13	17.4 1.1	41.28 .21	19.5 1.4
29.5	52.40 +.02	18.8 2 4	21.48 .08	49.4 +0.1	57.64 .08	16.5 0.8	41.45 .14	21.0 1.6
Feb. 8.5	52.39 −.03	21.1 2.2	21.53 +.03	49.5 0.2	57.70 +.03	15.7 0.6	41.55 +.06	22.8 1.8
18.4	52.33 −.08	23.2 −1.9	21.53 −.02	49.8 +0.4	57.71 −.01	15.2 −0.4	41.57 −.01	24.6 +1.9
28.4	52.23 .12	24.9 1.6	21.48 .07	50.3 0.5	57.67 .05	14.9 0.2	41.53 .07	26.5 1.8
Mar. 10.4	52.09 .15	26.3 1.2	21.39 .11	50.8 0.6	57.59 .09	14.7 −0.1	41.42 .13	28.3 1.7
20.4	51.93 .17	27.3 0.8	21.27 .14	51.4 0.6	57.49 .12	14.8 +0.1	41.27 .18	30.0 1.6
30.3	51.75 .19	27.9 0.5	21.12 .15	52.0 0.6	57.35 .14	14.9 0.2	41.07 .21	31.5 1.3
Apr. 9.3	51.55 −.19	28.2 −0.1	20.97 −.16	52.6 +0.5	57.21 −.15	15.2 +0.3	40.84 −.23	32.7 +1.1
19.3	51.36 .19	28.2 +0.2	20.80 .16	53.1 0.5	57.06 .15	15.6 0.4	40.61 .24	33.6 0.7
29.3	51.18 .17	27.7 0.6	20.65 .15	53.5 0.4	56.91 .14	16.0 0.5	40.37 .23	34.2 0.4
May 9.2	51.01 .15	27.0 0.9	20.50 .13	53.9 0.3	56.77 .13	16.5 0.5	40.14 .21	34.4 +0.1
19.2	50.87 .13	25.8 1.3	20.38 .11	54.2 0.3	56.65 .11	17.1 0.6	39.94 .19	34.3 −0.3
29.2	50.75 −.10	24.5 +1.5	20.29 −.08	54.5 +0.2	56.56 −.08	17.7 +0.6	39.77 −.16	33.8 −0.6
June 8.1	50.67 .07	22.8 1.8	20.22 .05	54.6 +0.1	56.49 .06	18.3 0.6	39.63 .12	33.0 0.9
18.1	50.62 −.04	20.9 2.0	20.19 −.02	54.7 0.0	56.44 −.03	19.0 0.7	39.54 .07	32.0 1.2
28.1	50.60 .00	18.8 2.1	20.19 +.02	54.7 0.0	56.43 .00	19.6 0.7	39.49 −.03	30.7 1.4
July 8.1	50.62 +.03	16.6 2.2	20.22 .05	54.6 −0.1	56.44 +.03	20.3 0.6	39.48 +.02	29.2 1.6
18.0	50.67 +.07	14.4 +2.2	20.29 +.08	54.4 −0.2	56.49 +.06	20.9 +0.6	39.52 +.06	27.5 −1.8
28.0	50.75 .10	12.2 2.2	20.39 .11	54.2 0.3	56.56 .09	21.5 0.5	39.61 .11	25.7 1.9
Aug. 7.0	50.87 .13	10.0 2.1	20.52 .14	53.9 0.4	56.67 .12	21.9 0.4	39.74 .15	23.7 2.0
17.0	51.02 .17	8.0 1.9	20.68 .17	53.5 0.5	56.80 .14	22.3 0.3	39.92 .20	21.7 2.1
26.9	51.21 .20	6.2 1.6	20.86 .20	53.0 0.6	56.95 .17	22.5 +0.1	40.13 .24	19.6 2.1
Sept. 5.9	51.42 +.22	4.7 +1.3	21.08 +.23	52.3 −0.7	57.14 +.20	22.5 −0.1	40.39 +.28	17.5 −2.1
15.9	51.65 .25	3.7 0.9	21.32 .25	51.6 0.8	57.35 .23	22.3 0.3	40.69 .32	15.5 2.0
25.8	51.92 .27	3.0 +0.4	21.58 .28	50.7 0.9	57.59 .25	21.9 0.5	41.02 .35	13.5 1.9
Oct. 5.8	52.20 .29	2.8 0.0	21.87 .30	49.7 1.0	57.85 .27	21.2 0.8	41.39 .38	11.6 1.8
15.8	52.50 .31	3.1 −0.5	22.18 .32	48.6 1.1	58.13 .29	20.3 1.0	41.79 .41	9.8 1.7
25.8	52.82 +.32	3.9 −1.0	22.50 +.33	47.4 −1.2	58.43 +.31	19.2 −1.2	42.22 +.44	8.2 −1.5
Nov. 4.7	53.14 .32	5.1 1.5	22.84 .34	46.2 1.2	58.74 .32	17.9 1.4	42.67 .45	6.9 1.2
14.7	53.45 .31	6.9 1.9	23.18 .34	44.9 1.2	59.07 .32	16.4 1.5	43.13 .46	5.8 0.9
24.7	53.76 .30	9.0 2.3	23.52 .33	43.7 1.1	59.39 .31	14.8 1.6	43.59 .46	5.0 0.6
Dec. 4.7	54.05 .28	11.4 2.5	23.85 .32	42.6 1.0	59.70 .30	13.2 1.6	44.04 .44	4.6 −0.2
14.6	54.31 +.24	14.0 −2.7	24.15 +.29	41.6 −0.9	60.00 +.28	11.5 −1.6	44.47 +.41	4.6 +0.2
24.6	54.54 .20	16.8 2.8	24.43 .26	40.8 0.7	60.27 .25	9.9 1.5	44.86 .37	5.0 0.5
34.6	54.72 +.16	19.6 −2.8	24.68 +.22	40.2 −0.5	60.50 +.21	8.5 −1.4	45.21 +.32	5.7 +0.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	σ² Ursæ Majoris.		κ Cancri.		ι Argûs.		1 Draconis (H.)	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 9 0	+67° 34′	h m 9 1	+11° 6′	h m 9 14	−58° 48′	h m 9 21	+81° 48′
	s	″	s	″	s	″	s	″
(Dec.30.6)	43.50 +.54	42.3 +1.5	47.41 +.25	38.4 −1.3	10.13 +.31	33.8 −3.5	25.63+1.37	33.0 +1.9
Jan. 9.6	44.00 .44	44.1 2.0	47.63 .21	37.2 1.1	10.40 .23	37.3 3.6	26.89 1.13	35.1 2.3
19.6	44.38 .33	46.2 2.3	47.82 .16	36.2 0.9	10.60 .15	41.0 3.7	27.90 .87	37.7 2.7
29.5	44.66 .21	48.7 2.5	47.95 .11	35.4 0.6	10.71 +.07	44.8 3.7	28.62 .57	40.5 2.9
Feb. 8.5	44.81 +.09	51.3 2.6	48.04 .06	34.9 0.4	10.73 −.01	48.5 3.6	29.04 +.26	43.5 3.1
18.5	44.84 −.03	54.0 +2.7	48.07 +.01	34.6 −0.2	10.68 −.09	52.1 −3.4	29.14 −.05	46.6 +3.1
28.4	44.75 .14	56.6 2.6	48.05 −.04	34.5 0.0	10.55 .16	55.4 3.2	28.94 .35	49.7 3.0
Mar. 10.4	44.55 .24	59.1 2.4	47.99 .08	34.6 +0.1	10.35 .23	58.4 2.9	28.45 .62	52.6 2.7
20.4	44.27 .32	61.3 2.1	47.90 .11	34.8 0.3	10.09 .28	61.1 2.5	27.70 .86	55.2 2.4
30.4	43.91 .39	63.3 1.7	47.78 .13	35.2 0.4	9.79 .32	63.4 2.0	26.74 1.05	57.4 2.0
Apr. 9.3	43.49 −.43	64.8 +1.3	47.65 −.14	35.6 +0.4	9.46 −.35	65.2 −1.6	25.60−1.19	59.2 +1.5
19.3	43.05 .45	65.8 0.8	47.50 .14	36.0 0.5	9.10 .36	66.5 1.1	24.35 1.28	60.5 1.0
29.3	42.59 .45	66.4 +0.3	47.36 .14	36.5 0.5	8.73 .37	67.3 −0.6	23.04 1.32	61.2 +0.4
May 9.3	42.15 .43	66.5 −0.2	47.22 .13	37.1 0.5	8.36 .37	67.6 0.0	21.72 1.30	61.3 −0.2
19.2	41.74 .39	66.0 0.6	47.10 .11	37.6 0.5	8.00 .35	67.4 +0.5	20.44 1.24	60.9 0.7
29.2	41.37 −.34	65.2 −1.1	46.99 −.09	38.1 +0.5	7.65 −.33	66.7 +1.0	19.25−1.13	59.9 −1.2
June 8.2	41.06 .28	63.9 1.5	46.91 .07	38.6 0.5	7.34 .30	65.4 1.4	18.18 .99	58.4 1.7
18.1	40.82 .20	62.2 1.9	46.86 .04	39.1 0.5	7.06 .26	63.8 1.9	17.27 .82	56.4 2.2
28.1	40.65 .13	60.2 2.2	46.83 −.01	39.5 0.4	6.82 .22	61.7 2.3	16.54 .62	54.1 2.5
July 8.1	40.56 −.05	57.8 2.4	46.83 +.01	39.9 0.4	6.62 .16	59.3 2.6	16.02 .41	51.4 2.8
18.1	40.56 +.04	55.3 −2.6	46.86 +.04	40.3 +0.3	6.49 −.11	56.6 +2.8	15.72 −.19	48.4 −3.1
28.0	40.63 .12	52.6 2.8	46.92 .07	40.5 0.2	6.41 −.05	53.6 3.0	15.64 +.04	45.2 3.2
Aug. 7.0	40.79 .20	49.7 2.9	47.00 .10	40.7 +0.1	6.39 +.01	50.6 3.0	15.79 .27	41.9 3.3
17.0	41.04 .28	46.9 2.9	47.12 .13	40.7 0.0	6.44 .08	47.6 3.0	16.17 .49	38.5 3.4
27.0	41.36 .36	44.0 2.8	47.26 .16	40.6 −0.2	6.55 .15	44.6 2.9	16.78 .71	35.1 3.3
Sept. 5.9	41.75 +.43	41.2 −2.8	47.43 +.18	40.3 −0.4	6.74 +.22	41.8 +2.6	17.60 +.92	31.9 −3.2
15.9	42.22 .50	38.5 2.6	47.63 .21	39.9 0.6	6.98 .28	39.4 2.3	18.62 1.12	28.7 3.1
25.9	42.75 .56	35.9 2.4	47.85 .24	39.2 0.8	7.30 .34	37.3 1.8	19.84 1.30	25.8 2.8
Oct. 5.8	43.34 .62	33.6 2.2	48.10 .26	38.3 1.0	7.67 .39	35.7 1.3	21.23 1.46	23.1 2.5
15.8	43.99 .67	31.6 1.9	48.38 .29	37.3 1.2	8.08 .44	34.7 0.7	22.77 1.60	20.8 2.1
25.8	44.68 +.71	29.9 −1.5	48.68 +.31	36.0 −1.3	8.54 +.47	34.3 +0.1	24.44+1.71	18.9 −1.7
Nov. 4.8	45.40 .73	28.6 1.1	49.00 .32	34.6 1.5	9.03 .49	34.6 −0.6	26.20 1.79	17.4 1.2
14.7	46.14 .74	27.7 0.7	49.32 .33	33.1 1.6	9.52 .49	35.5 1.2	28.01 1.82	16.4 0.7
24.7	46.89 .73	27.3 −0.2	49.65 .33	31.5 1.6	10.01 .48	37.0 1.8	29.85 1.82	16.0 −0.1
Dec. 4.7	47.62 .71	27.4 +0.3	49.98 .32	29.8 1.6	10.48 .45	39.2 2.4	31.65 1.76	16.2 +0.4
14.7	48.31 +.66	27.9 +0.8	50.29 +.30	28.3 −1.5	10.92 +.41	41.8 −2.9	33.37+1.66	16.9 +1.0
24.6	48.94 .60	29.0 1.3	50.58 .27	26.8 1.4	11.30 .35	44.9 3.3	34.96 1.51	18.2 1.5
34.6	49.50 +.51	30.5 +1.7	50.84 +.23	25.5 −1.3	11.62 +.28	48.3 −3.6	36.37+1.29	20.0 +2.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*a* Hydræ.		*d* Ursæ Majoris.		*θ* Ursæ Majoris.		*ε* Leonis.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 9 22	° ′ − 8 10	h m 9 24	° ′ +70 18	h m 9 25	° ′ +52 10	h m 9 39	° ′ +24 16
	s	″	s	″	s	″	s	″
(Dec.30.6)	10.97 +.25	50.6 −2.3	45.78 +.63	38.7 +1.4	29.99 +.39	34.3 +0.6	36.31 +.30	47.0 −0.8
Jan. 9.6	11.20 .21	52.8 2.1	46.38 .54	40.3 1.9	30.36 .33	35.2 1.0	36.58 .26	46.3 0.5
19.6	11.39 .16	54.9 2.0	46.87 .43	42.4 2.3	30.66 .27	36.4 1.4	36.82 .21	46.0 −0.2
29.5	11.53 .11	56.9 1.8	47.23 .30	44.8 2.5	30.89 .19	38.0 1.7	37.01 .16	45.9 +0.1
Feb. 8.5	11.62 .07	58.6 1.6	47.46 .16	47.5 2.7	31.04 .11	39.8 1.9	37.14 .11	46.1 0.3
18.5	11.66 +.02	60.1 −1.4	47.55 +.03	50.3 +2.8	31.12 +.04	41.8 +2.0	37.22 +.05	46.5 +0.5
28.4	11.66 −.03	61.4 1.1	47.51 −.10	53.1 2.7	31.12 −.04	43.9 2.1	37.24 .00	47.2 0.7
Mar. 10.4	11.61 .07	62.4 0.9	47.34 .22	55.8 2.6	31.05 .10	46.0 2.0	37.22 −.04	48.0 0.9
20.4	11.52 .10	63.1 0.6	47.06 .33	58.2 2.3	30.91 .16	48.0 1.9	37.15 .08	48.9 0.9
30.4	11.41 .12	63.6 0.4	46.69 .41	60.4 2.0	30.73 .20	49.8 1.7	37.05 .11	49.8 0.9
Apr. 9.3	11.29 −.13	63.8 −0.1	46.25 −.46	62.2 +1.6	30.50 −.23	51.4 +1.4	36.93 −.13	50.8 +0.9
19.3	11.15 .14	63.9 +0.1	45.76 .50	63.5 1.1	30.26 .25	52.6 1.1	36.79 .14	51.6 0.8
29.3	11.00 .14	63.7 0.3	45.25 .51	64.4 0.6	30.01 .25	53.5 0.7	36.64 .15	52.4 0.7
May 9.3	10.86 .13	63.3 0.5	44.74 .50	64.7 +0.1	29.76 .24	54.1 +0.3	36.50 .14	53.1 0.6
19.2	10.73 .12	62.7 0.7	44.24 .47	64.5 −0.4	20.52 .23	54.2 −0.1	36.36 .13	53.6 0.5
29.2	10.62 −.11	61.9 +0.8	43.79 −.43	63.9 −0.9	29.30 −.20	53.9 −0.5	36.24 −.11	54.0 +0.3
June 8.2	10.52 .09	61.0 1.0	43.39 .37	62.7 1.4	29.12 .16	53.3 0.8	36.13 .09	54.3 +0.2
18.1	10.45 .06	60.0 1.1	43.06 .30	61.1 1.8	28.98 .12	52.3 1.1	36.05 .07	54.3 0.0
28.1	10.40 .04	58.9 1.2	42.80 .21	59.2 2.1	28.87 .08	51.0 1.4	35.99 .04	54.3 −0.2
July 8.1	10.37 −.01	57.6 1.2	42.63 .13	56.9 2.4	28.81 −.04	49.4 1.7	35.96 −.02	54.0 0.3
18.1	10.37 +.01	56.4 +1.3	42.54 −.04	54.3 −2.7	28.80 +.01	47.6 −1.9	35.96 +.01	53.7 −0.5
28.0	10.39 .04	55.1 1.2	42.55 +.05	51.5 2.9	28.83 .06	45.6 2.1	35.99 .04	53.1 0.6
Aug. 7.0	10.45 .07	53.9 1.1	42.65 .14	48.5 3.0	28.91 .11	43.4 2.3	36.04 .07	52.4 0.8
17.0	10.53 .10	52.8 1.0	42.84 .24	45.5 3.1	29.04 .15	41.0 2.4	36.13 .10	51.6 0.9
27.0	10.64 .13	51.9 0.8	43.12 .33	42.4 3.1	29.22 .20	38.6 2.4	36.24 .13	50.6 1.1
Sept. 5.9	10.78 +.15	51.1 +0.6	43.49 +.41	39.3 −3 0	29.44 +.24	36.1 −2.5	36.39 +.16	49.5 −1.2
15.9	10.95 .19	50.7 +0.3	43.95 .50	36.4 2.9	29.71 .29	33.7 2.5	36.56 .19	48.2 1.4
25.9	11.15 .22	50.5 0.0	44.49 .58	33.5 2.7	30.02 .33	31.2 2.4	36.77 .23	46.8 1.5
Oct. 5.8	11.38 .24	50.6 −0.3	45.10 .65	30.9 2.5	30.38 .37	28.9 2.3	37.02 .26	45.2 1.6
15.8	11.64 .27	51.1 0.7	45.78 .71	28.5 2.2	30.77 .41	26.7 2.1	37.29 .29	43.6 1.7
25.8	11.92 +.29	52.0 −1.0	46.51 +.76	26.5 −1.8	31.20 +.45	24.7 −1.9	37.59 +.31	41.8 −1.7
Nov. 4.8	12.23 .31	53.2 1.4	47.30 .80	24.9 1.4	31.66 .47	22.9 1.6	37.92 .33	40.1 1.7
14.7	12.54 .32	54.7 1.7	48.11 .82	23.7 1.0	32.14 .49	21.5 1.3	38.26 .35	38.4 1.7
24.7	12.87 .32	56.5 1.9	48.94 .83	23.0 −0.5	32.64 .49	20.3 0.9	38.62 .36	36.7 1.6
Dec. 4.7	13.19 .31	58.6 2.1	49.77 .81	22.8 0.0	33.13 .48	19.6 0.5	38.98 .35	35.1 1.5
14.7	13.50 +.30	60.7 −2.2	50.56 +.77	23.1 +0.5	33.60 +.46	19.3 −0.1	39.33 +.34	33.8 −1.3
24.6	13.79 .27	63.0 2.3	51.29 .70	23.9 1.1	34.05 .43	19.4 +0.3	39.66 .32	32.6 1.0
34.6	14.04 +.24	65.2 −2.2	51.96 +.61	25.3 +1.6	34.45 +.38	20.0 +0.8	39.96 +.29	31.8 −0.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	μ Leonis.		α Leonis. (*Regulus.*)		32 Ursæ Majoris.		γ¹ Leonis.	
	Right Ascension.	**Declination** *North.*	**Right Ascension.**	**Declination** *North.*	**Right Ascension.**	**Declination** *North.*	**Right Ascension.**	**Declination** *North.*
	h m 9 46	+26° 31′	h m 10 2	+12° 30′	h m 10 10	+65° 38′	h m 10 13	+20° 23′
	s	″	s	″	s	″	s	″
(Dec.30.6)	30.29 +.31	26.1 −0.8	30.61 +.29	16.9 −1.4	2.82 +.60	73.7 +0.7	54.19 +.31	50.3 −1.2
Jan. 9.6	30.58 .27	25.5 0.4	30.88 .25	15.6 1.2	3.39 .53	74.7 1.2	54.49 .28	49.2 0.9
19.6	30.82 .22	25.2 −0.1	31.12 .21	14.4 1.0	3.88 .45	76.2 1.7	54.75 .24	48.5 0.6
29.6	31.02 .17	25.2 +0.2	31.31 .16	13.6 0.7	4.29 .35	78.1 2.1	54.96 .19	48.0 −0.3
Feb. 8.5	31.16 .11	25.5 0.5	31.46 .12	13.0 0.5	4.58 .24	80.4 2.4	55.13 .14	47.8 0.0
18.5	31.25 +.06	26.1 +0.7	31.55 +.07	12.6 −0.2	4.77 +.13	82.9 +2.6	55.24 +.09	48.0 +0.3
28.5	31.28 +.01	26.9 0.8	31.60 +.02	12.5 0.0	4.85 +.02	85.6 2.7	55.30 +.04	48.3 0.5
Mar. 10.5	31.26 −.04	27.8 0.9	31.60 −.02	12.7 +0.2	4.82 −.08	88.3 2.7	55.31 −.01	48.9 0.7
20.4	31.20 .08	28.8 1.0	31.55 .05	13.0 0.4	4.69 .17	90.9 2.5	55.28 .05	49.7 0.8
30.4	31.11 .11	29.9 1.0	31.48 .08	13.4 0.5	4.48 .25	93.4 2.3	55.21 .08	50.5 0.9
Apr. 9.4	30.98 −.13	30.9 +1.0	31.38 −.11	14.0 +0.6	4.20 −.31	95.5 +2.0	55.12 −.10	51.4 +0.9
19.3	30.84 .14	31.9 0.9	31.26 .12	14.6 0.6	3.86 .36	97.4 1.6	55.00 .12	52.3 0.9
29.3	30.69 .15	32.7 0.8	31.14 .13	15.2 0.7	3.48 .38	98.7 1.2	54.88 .13	53.2 0.8
May 9.3	30.54 .14	33.5 0.6	31.01 .13	15.9 0.6	3.09 .39	99.7 0.7	54.75 .13	53.9 0.7
19.3	30.40 .13	34.0 0.5	30.88 .11	16.5 0.6	2.69 .39	100.1 +0.2	54.62 .12	54.6 0.6
29.2	30.28 −.12	34.4 +0.3	30.77 −.10	17.1 +0.5	2.31 −.37	100.0 −0.3	54.50 −.11	55.2 +0.5
June 8.2	30.17 .10	34.6 +0.1	30.67 .09	17.6 0.5	1.96 .33	99.5 0.8	54.39 .10	55.6 0.4
18.2	30.08 .08	34.7 −0.1	30.58 .07	18.1 0.4	1.64 .29	98.5 1.2	54.30 .08	55.9 0.2
28.2	30.02 .05	34.5 0.2	30.52 .05	18.4 0.4	1.38 .24	97.0 1.6	54.22 .06	56.1 +0.1
July 8.1	29.98 −.02	34.2 0.4	30.48 .03	18.8 0.3	1.17 .18	95.2 2.0	54.17 .04	56.0 −0.1
18.1	29.97 +.01	33.7 −0.6	30.45 −.01	19.0 +0.1	1.02 −.12	93.0 −2.3	54.14 −.02	55.9 −0.2
28.1	29.99 .03	33.0 0.7	30.46 +.01	19.1 0.0	0.94 −.05	90.5 2.6	54.13 +.01	55.6 0.4
Aug. 7.0	30.04 .06	32.2 0.9	30.48 .04	19.0 0.0	0.92 +.02	87.8 2.8	54.15 .03	55.1 0.6
17.0	30.11 .09	31.2 1.1	30.54 .06	18.8 −0.2	0.98 .09	84.8 3.0	54.20 .06	54.4 0.8
27.0	30.22 .12	30.1 1.2	30.62 .09	18.5 0.4	1.10 .16	81.7 3.1	54.28 .09	53.5 0.9
Sept. 6.0	30.36 +.16	28.8 −1.4	30.73 +.12	18.0 −0.6	1.30 +.24	78.6 −3.2	54.38 +.12	52.5 −1.1
15.9	30.54 .19	27.4 1.5	30.88 .15	17.3 0.8	1.58 .31	75.4 3.2	54.52 .15	51.3 1.3
25.9	30.74 .22	25.8 1.6	31.05 .19	16.3 1.0	1.92 .38	72.3 3.1	54.69 .19	50.0 1.5
Oct. 5.9	30.98 .26	24.1 1.7	31.26 .22	15.2 1.2	2.34 .45	69.3 2.9	54.90 .22	48.4 1.6
15.9	31.26 .29	22.4 1.8	31.50 .25	13.9 1.4	2.82 .52	66.4 2.7	55.14 .26	46.7 1.8
25.8	31.56 +.31	20.6 −1.8	31.77 +.28	12.4 −1.6	3.37 +.57	63.8 −2.5	55.41 +.29	44.9 −1.9
Nov. 4.8	31.88 .33	18.7 1.8	32.06 .31	10.7 1.8	3.97 .62	61.5 2.1	55.71 .31	43.0 1.9
14.8	32.23 .35	16.9 1.7	32.38 .32	8.9 1.8	4.61 .66	59.6 1.7	56.04 .33	41.1 1.9
24.7	32.59 .36	15.2 1.6	32.71 .33	7.0 1.9	5.29 .68	58.1 1.2	56.38 .35	39.1 1.9
Dec. 4.7	32.96 .36	13.7 1.4	33.05 .34	5.1 1.9	5.98 .69	57.1 0.7	56.74 .35	37.3 1.8
14.7	33.31 +.35	12.3 −1.2	33.39 +.33	3.3 −1.8	6.66 +.67	56.6 −0.2	57.09 +.34	35.6 −1.6
24.7	33.66 .33	11.2 1.0	33.71 .31	1.6 1.6	7.32 .64	56.7 +0.4	57.43 .33	34.1 1.4
34.6	33.97 +.30	10.4 −0.7	34.01 +.28	0.1 −1.4	7.94 +.58	57.3 +0.9	57.75 +.31	32.8 −1.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	9 Draconis (H.)		ρ Leonis.		η Argûs.		l Leonis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 10 25	+76° 16′	h m 10 27	+ 9° 52′	h m 10 40	−59° 6′	h m 10 43	+11° 7′
	s	″	s	″	s	″	s	″
(Dec.30.6)	45.39+1.00	33.9 +0.9	0.85 +.30	22.0 −1.7	48.19 +.44	2.1 −2.8	28.13 +.31	38.6 −1.7
Jan. 9.6	46.34 .90	35.1 1.4	1.14 .27	20.5 1.5	48.60 .38	5.1 3.2	28.43 .28	37.0 1.5
19.6	47.18 .76	36.8 1.9	1.40 .23	19.1 1.2	48.95 .32	8.4 3.5	28.70 .25	35.6 1.2
29.6	47.87 .61	39.0 2.4	1.61 .19	18.0 1.0	49.23 .24	12.0 3.6	28.93 .20	34.6 0.9
Feb. 8.5	48.39 .43	41.5 2.7	1.78 .14	17.2 0.7	49.43 .17	15.7 3.7	29.11 .16	33.7 0.7
18.5	48.74 +.25	44.3 +2.9	1.89 +.09	16.6 −0.4	49.56 +.09	19.4 −3.7	29.24 +.11	33.2 −0.4
28.5	48.89 +.06	47.3 3.0	1.96 +.04	16.3 −0.2	49.61 +.01	23.1 3.6	29.33 .06	33.0 −0.1
Mar. 10.5	48.86 −.11	50.3 3.0	1.98 .00	16.3 +0.1	49.59 −.06	26.6 3.4	29.37 +.02	33.0 +0.1
20.4	48.66 .28	53.2 2.8	1.97 −.03	16.4 0.2	49.49 .12	29.9 3.1	29.37 −.02	33.2 0.3
30.4	48.30 .43	55.9 2.5	1.92 .06	16.8 0.4	49.34 .18	32.9 2.8	29.33 .05	33.6 0.5
Apr. 9.4	47.81 −.55	58.3 +2.2	1.84 −.09	17.2 +0.5	49.14 −.23	35.6 −2.5	29.27 −.06	34.2 +0.6
19.4	47.21 .64	60.3 1.8	1.74 .11	17.8 0.6	48.89 .26	37.8 2.1	29.18 10	34.8 0.7
29.3	46.53 .70	61.8 1.3	1.63 .12	18.4 0.6	48.61 .29	39.7 1.6	29.08 .11	35.5 0.7
May 9.3	45.80 .74	62.8 0.7	1.51 .12	19.0 0.6	48.31 .31	41.1 1.1	28.96 .11	36.2 0.7
19.3	45.06 .74	63.3 +0.2	1.39 .12	19.7 0.6	47.98 .32	42.0 0.7	28.85 .11	36.9 0.7
29.3	44.32 −.72	63.3 −0.3	1.28 −.11	20.3 +0.6	47.66 −.33	42.4 −0.2	28.74 −.11	37.5 +0.6
June 8.2	43.61 .68	62.6 0.9	1.17 .10	20.9 0.6	47.33 .32	42.3 +0.3	28.63 .10	38.1 0.6
18.2	42.97 .61	61.5 1.4	1.08 .08	21.4 0.5	47.01 .31	41.7 0.8	28.53 .09	38.7 0.5
28.2	42.39 .53	59.9 1.8	1.00 .07	21.9 0.4	46.71 .29	40.7 1.3	28.45 .08	39.1 0.4
July 8.1	41.91 .43	57.8 2.3	0.94 .05	22.3 0.4	46.43 .26	39.2 1.7	28.38 .06	39.5 0.3
18.1	41.53 −.32	55.3 −2.6	0.91 −.03	22.6 +0.3	46.19 −.22	37.2 +2.1	28.33 −.04	39.8 +0.2
28.1	41.26 .21	52.6 2.9	0.89 −.01	22.8 +0.1	45.99 .18	34.9 2.4	28.30 −.02	39.9 +0.1
Aug. 7.1	41.11 −.09	49.5 3.2	0.89 +.02	22.9 0.0	45.83 .13	32.4 2.6	28.29 .00	39.9 −0.1
17.0	41.09 +.04	46.2 3.4	0.92 .04	22.9 −0.1	45.73 −.07	29.6 2.8	28.31 +.03	39.7 0.2
27.0	41.19 .17	42.8 3.5	0.98 .07	22.6 0.3	45.70 .00	26.8 2.8	28.35 .06	39.4 0.4
Sept. 6.0	41.43 +.30	39.3 −3.5	1.07 +.10	22.2 −0.5	45.73 +.07	24.0 +2.8	28.42 +.09	38.9 −0.6
16.0	41.80 .43	35.8 3.5	1.18 .13	21.6 0.7	45.83 .14	21.3 2.6	28.52 .12	38.2 0.8
25.9	42.29 .56	32.3 3.4	1.33 .17	20.7 1.0	46.01 .22	18.7 2.4	28.65 .15	37.3 1.1
Oct. 5.9	42.91 .68	29.0 3.2	1.52 .20	19.7 1.2	46.26 .29	16.6 2.0	28.82 .19	36.1 1.3
15.9	43.65 .79	25.9 2.9	1.74 .23	18.4 1.4	46.59 .36	14.8 1.5	29.03 .22	34.7 1.5
25.8	44.50 +.90	23.1 −2.6	1.99 +.27	16.9 −1.6	46.97 +.41	13.5 +1.0	29.27 +.26	33.1 −1.7
Nov. 4.8	45.45 .98	20.7 2.2	2.27 .30	15.2 1.8	47.42 .46	12.8 +0.4	29.54 .29	31.3 1.8
14.8	46.47 1.05	18.7 1.8	2.58 .32	13.4 1.9	47.90 .50	12.7 −0.2	29.84 .31	29.4 1.9
24.7	47.55 1.10	17.2 1.3	2.90 .33	11.4 2.0	48.41 .52	13.3 0.9	30.17 .33	27.4 2.0
Dec. 4.7	48.66 1.11	16.2 0.7	3.24 .34	9.4 2.0	48.93 .52	14.5 1.5	30.51 .34	25.3 2.0
14.7	49.78+1.10	15.8 −0.1	3.58 +.33	7.5 −1.9	49.44 +.50	16.2 −2.0	30.85 +.34	23.3 −1.9
24.7	50.86 1.05	16.0 +0.5	3.91 .31	5.6 1.8	49.93 .47	18.6 2.5	31.18 .33	21.4 1.8
34.6	51.87+ .97	16.8 +1.1	4.22 +.30	3.9 −1.6	50.38 +.42	21.3 −3.0	31.50 +.31	19.7 −1.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Majoris.		δ Leonis.		δ Crateris.		τ Leonis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	$10^{\mathrm{h}}\ 56^{\mathrm{m}}$	$+62^\circ\ 20'$	$11^{\mathrm{h}}\ 8^{\mathrm{m}}$	$+21^\circ\ 7'$	$11^{\mathrm{h}}\ 13^{\mathrm{m}}$	$-14^\circ\ 10'$	$11^{\mathrm{h}}\ 22^{\mathrm{m}}$	$+\ 3^\circ\ 27'$
	s	″	s	″	s	″	s	″
(Dec.30.7)	56.01 +.58	30.2 0.0	14.96 +.34	32.6 −1.5	50.00 +.32	50.9 −2.4	16.21 +.32	46.9 −2.0
Jan. 9.7	56.57 .54	30.5 +0.6	15.29 .31	31.3 1.2	50.30 .29	53.3 2.4	16.52 .30	44.9 1.9
19.6	57.08 .48	31.3 1.1	15.58 .28	30.2 0.9	50.58 .26	55.7 2.3	16.81 .27	43.1 1.7
29.6	57.52 .40	32.7 1.6	15.84 .24	29.5 0.5	50.82 .22	58.0 2.2	17.06 .23	41.5 1.5
Feb. 8.6	57.88 .31	34.5 2.0	16.06 .19	29.2 −0.2	51.02 .18	60.2 2.1	17.27 .19	40.2 1.2
18.5	58.15 +.22	36.7 +2.3	16.23 +.14	29.2 +0.2	51.17 +.13	62.2 −1.9	17.44 +.14	39.1 −0.9
28.5	58.31 .12	39.1 2.5	16.34 .09	29.5 0.5	51.28 .09	64.0 1.7	17.56 .10	38.4 0.6
Mar. 10.5	58.39 +.02	41.8 2.6	16.41 .05	30.1 0.7	51.35 .04	65.5 1.4	17.64 .06	37.8 0.4
20.5	58.37 −.06	44.4 2.6	16.44 +.01	31.0 0.9	51.37 +.01	66.8 1.2	17.67 +.02	37.6 −0.1
30.4	58.27 .14	47.1 2.5	16.42 −.03	31.9 1.0	51.36 −.03	67.9 0.9	17.67 −.01	37.5 +0.1
Apr. 9.4	58.10 −.20	49.5 +2.3	16.38 −.06	33.0 +1.1	51.31 −.05	68.7 −0.7	17.64 −.04	37.7 +0.2
19.4	57.86 .26	51.7 2.0	16.30 .09	34.1 1.1	51.25 .08	69.3 0.4	17.59 .07	38.0 0.4
29.4	57.58 .29	53.6 1.7	16.20 .10	35.1 1.0	51.16 .09	69.6 −0.2	17.51 .08	38.5 0.5
May 9.3	57.27 .32	55.0 1.3	16.10 .11	36.2 1.0	51.06 .10	69.7 0.0	17.42 .09	39.0 0.6
19.3	56.94 .33	56.0 0.8	15.98 .12	37.1 0.9	50.95 .11	69.6 +0.2	17.32 .10	39.6 0.6
29.3	56.60 −.33	56.6 +0.3	15.86 −.12	37.9 +0.7	50.84 −.11	69.3 +0.4	17.22 −.10	40.2 +0.6
June 8.2	56.28 .32	56.6 −0.2	15.75 .11	38.5 0.5	50.73 .11	68.8 0.6	17.12 .10	40.8 0.6
18.2	55.97 .29	56.2 0.7	15.64 .10	39.0 0.4	50.62 .11	68.1 0.7	17.02 .10	41.5 0.6
28.2	55.70 .26	55.3 1.1	15.54 .09	39.3 +0.2	50.52 .10	67.3 0.9	16.93 .09	42.1 0.6
July 8.2	55.45 .22	53.9 1.5	15.46 .08	39.4 0.0	50.42 .09	66.3 1.0	16.84 .08	42.7 0.6
18.1	55.25 −.18	52.2 −1.9	15.38 −.06	39.2 −0.2	50.34 −.07	65.3 +1.1	16.77 −.07	43.2 +0.5
28.1	55.10 .13	50.1 2.3	15.33 .04	38.9 0.4	50.28 .06	64.2 1.1	16.71 .05	43.6 0.4
Aug. 7.1	54.99 .08	47.6 2.6	15.30 −.02	38.4 0.6	50.23 .04	63.1 1.1	16.67 .03	44.0 0.3
17.1	54.95 −.02	44.9 2.9	15.29 .00	37.7 0.8	50.20 −.01	61.9 1.1	16.65 −.01	44.2 +0.1
27.0	54.96 +.04	41.9 3.1	15.31 +.03	36.8 1.0	50.20 +.01	60.9 1.0	16.65 +.01	44.3 0.0
Sept. 6.0	55.03 +.11	38.7 −3.2	15.36 +.06	35.6 −1.3	50.23 +.04	60.0 +0.8	16.67 +.04	44.2 −0.2
16.0	55.18 .17	35.5 3.3	15.44 .10	34.3 1.5	50.29 .06	59.2 0.6	16.73 .06	43.9 0.4
25.9	55.38 .24	32.1 3.3	15.55 .13	32.7 1.6	50.39 .12	58.7 0.4	16.83 .11	43.3 0.7
Oct. 5.9	55.66 .31	28.8 3.3	15.70 .17	31.0 1.8	50.53 .16	58.5 +0.1	16.96 .15	42.5 0.9
15.9	56.01 .38	25.6 3.2	15.89 .21	29.0 2.0	50.71 .20	58.6 −0.3	17.13 .19	41.5 1.2
25.9	56.42 +.44	22.5 −3.0	16.12 +.25	27.0 −2.1	50.93 +.24	59.0 −0.6	17.33 +.23	40.2 −1.4
Nov. 4.8	56.89 .50	19.7 2.7	16.39 .28	24.8 2.2	51.18 .27	59.8 1.0	17.58 .26	38.6 1.7
14.8	57.42 .55	17.2 2.3	16.69 .31	22.6 2.2	51.47 .30	61.0 1.3	17.85 .29	36.8 1.9
24.8	57.99 .59	15.0 1.9	17.02 .34	20.3 2.2	51.78 .32	62.5 1.7	18.15 .31	34.9 2.0
Dec. 4.8	58.59 .61	13.3 1.5	17.36 .35	18.2 2.1	52.11 .34	64.3 2.0	18.48 .33	32.8 2.1
14.7	59.21 +.61	12.1 −0.9	17.72 +.35	16.1 −1.9	52.45 +.34	66.4 −2.2	18.82 +.34	30.6 −2.2
24.7	59.82 .60	11.4 −0.4	18.07 .35	14.3 1.7	52.79 .33	68.6 2.3	19.16 .33	28.5 2.1
34.7	60.41 +.57	11.3 +0.2	18.42 +.34	12.7 −1.4	53.11 +.31	71.0 −2.4	19.48 +.31	26.4 −2.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	λ Draconis.		υ Leonis.		β Leonis.		γ Ursæ Majoris.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 11 24	° ′ +69 55	h m 11 31	° ′ − 0 12	h m 11 43	° ′ +15 10	h m 11 48	° ′ +54 17
	s	″	s	″	s	″	s	″
(Dec. 30.7)	51.85 +.77	64.9 −0.1	18.36 +.32	54.4 −2.1	26.20 +.33	72.9 −1.9	2.02 +.50	72.1 −0.9
Jan. 9.7	52.60 .72	65.1 +0.5	18.67 .30	56.5 2.0	26.53 .32	71.2 1.6	2.51 .48	71.5 −0.3
19.7	53.30 .66	65.9 1.1	18.96 .27	58.4 1.8	26.84 .29	69.7 1.3	2.97 .44	71.4 +0.2
29.6	53.91 .57	67.2 1.6	19.21 .24	60.2 1.6	27.11 .26	68.6 1.0	3.39 .39	71.9 0.8
Feb. 8.6	54.43 .46	69.1 2.1	19.43 .20	61.7 1.4	27.35 .22	67.8 0.6	3.75 .33	72.0 1.3
18.6	54.84 +.35	71.4 +2.5	19.60 +.15	63.0 −1.1	27.54 +.17	67.3 −0.3	4.05 +.26	74.5 +1.7
28.5	55.12 .22	74.0 2.7	19.73 .11	64.0 0.9	27.69 .13	67.2 0.0	4.27 .19	76.5 2.1
Mar. 10.5	55.28 +.10	76.8 2.9	19.82 .07	64.7 0.6	27.79 .08	67.4 +0.3	4.42 .12	78.7 2.3
20.5	55.31 −.03	79.7 2.9	19.87 +.03	65.2 0.4	27.85 +.04	67.9 0.6	4.50 +.04	81.1 2.5
30.5	55.23 .14	82.6 2.8	19.87 −.01	65.5 −0.2	27.87 .00	68.5 0.8	4.51 −.02	83.7 2.5
Apr. 9.4	55.04 −.24	85.4 +2.6	19.85 −.04	65.5 0.0	27.86 −.03	69.3 +0.9	4.46 −.08	86.2 +2.4
19.4	54.75 .32	87.8 2.3	19.80 .06	65.4 +0.2	27.82 .05	70.2 0.9	4.35 .13	88.6 2.3
29.4	54.39 .39	90.0 1.9	19.73 .08	65.1 0.3	27.75 .07	71.2 1.0	4.19 .17	90.8 2.1
May 9.3	53.97 .44	91.7 1.5	19.65 .09	64.7 0.4	27.67 .09	72.2 1.0	4.00 .20	92.7 1.7
19.3	53.52 .47	93.0 1.0	19.56 .10	64.2 0.5	27.57 .10	73.1 0.9	3.79 .22	94.2 1.4
29.3	53.04 −.48	93.8 +0.5	19.46 −.10	63.7 +0.6	27.47 −.10	74.0 +0.8	3.56 −.24	95.4 +1.0
June 8.3	52.56 .48	94.0 0.0	19.36 .10	63.1 0.6	27.36 .11	74.7 0.7	3.32 .24	96.1 0.5
18.2	52.09 .46	93.7 −0.5	19.26 .10	62.4 0.6	27.26 .10	75.4 0.6	3.08 .23	96.4 +0.1
28.2	51.64 .43	92.9 1.0	19.16 .09	61.8 0.7	27.15 .10	75.9 0.4	2.85 .22	96.3 −0.4
July 8.2	51.23 .38	91.6 1.5	19.07 .08	61.1 0.6	27.06 .09	76.2 0.3	2.63 .21	95.6 0.8
18.2	50.87 −.33	89.9 −2.0	19.00 −.07	60.5 +0.6	26.97 −.08	76.4 +0.1	2.43 −.19	94.6 −1.2
28.1	50.57 .27	87.7 2.4	18.93 .06	59.9 0.5	26.90 .07	76.4 −0.1	2.26 .16	93.1 1.6
Aug. 7.1	50.32 .20	85.1 2.7	18.88 .04	59.4 0.4	26.84 .05	76.2 0.3	2.12 .12	91.3 2.0
17.1	50.16 .13	82.2 3.0	18.85 −.02	59.0 0.3	26.79 .03	75.8 0.5	2.01 .09	89.1 2.4
27.0	50.07 −.05	79.1 3.3	18.84 +.01	58.7 +0.2	26.77 −.01	75.2 0.7	1.94 −.04	86.6 2.7
Sept. 6.0	50.06 +.04	75.7 −3.4	18.86 +.03	58.7 0.0	26.78 +.02	74.4 −0.9	1.92 .00	83.7 −2.9
16.0	50.14 .13	72.2 3.6	18.91 .07	58.8 −0.2	26.82 .06	73.4 1.1	1.95 +.05	80.7 3.1
26.0	50.32 .22	68.6 3.6	18.99 .10	59.1 0.4	26.89 .09	72.1 1.4	2.03 .11	77.5 3.2
Oct. 5.9	50.59 .32	64.9 3.6	19.11 .14	59.7 0.7	27.00 .13	70.6 1.6	2.17 .17	74.2 3.3
15.9	50.95 .41	61.4 3.5	19.27 .18	60.5 1.0	27.16 .17	68.9 1.8	2.37 .23	70.9 3.3
25.9	51.41 +.50	58.0 −3.3	19.47 +.22	61.6 −1.3	27.35 +.21	67.0 −2.0	2.63 +.29	67.6 −3.3
Nov. 4.9	51.96 .59	54.9 3.0	19.71 .25	63.0 1.5	27.58 .25	65.0 2.1	2.95 .35	64.3 3.1
14.8	52.58 .66	52.1 2.6	19.98 .29	64.7 1.8	27.85 .28	62.8 2.2	3.33 .40	61.3 2.9
24.8	53.28 .72	49.6 2.2	20.28 .31	66.6 2.0	28.15 .31	60.5 2.3	3.75 .44	58.5 2.6
Dec. 4.8	54.03 .76	47.7 1.7	20.60 .32	68.6 2.1	28.47 .33	58.2 2.2	4.22 .48	56.1 2.2
14.7	54.81 +.79	46.3 −1.1	20.94 +.33	70.7 −2.2	28.81 +.34	56.0 −2.1	4.71 +.50	54.1 −1.8
24.7	55.60 .78	45.4 −0.5	21.27 .33	72.9 2.2	29.16 .34	53.9 2.0	5.22 .51	52.5 1.3
34.7	56.37 +.76	45.2 +0.1	21.60 +.32	75.1 −2.1	29.50 +.33	52.0 −1.8	5.72 +.50	51.6 −0.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*o* Virginis.		4 Draconis (H.)		γ Corvi.		β Chamæleontis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	$11^{h}\ 59^{m}$	+ 9° 20′	$12^{h}\ 6^{m}$	+78° 13′	$12^{h}\ 10^{m}$	−16° 55′	$12^{h}\ 11^{m}$	−78° 41′
	s	″	s	″	s	″	s	″
(Dec.30.7)	35.52 +.33	40.2 −2.1	62.42+1.23	25.6 −0.5	8.11 +.34	40.9 −2.2	54.17+1.20	38.0 −1.4
Jan. 9.7	35.85 .32	38.2 1.8	63.64 1.19	25.4 +0.2	8.45 .32	43.2 2.3	55.34 1.12	39.8 2.0
19.7	36.16 .29	36.5 1.6	64.80 1.12	25.9 0.8	8.76 .30	45.5 2.3	56.42 1.02	42.1 2.5
29.6	36.44 .26	35.1 1.3	65.88 1.01	27.0 1.4	9.04 .27	47.9 2.3	57.39 .90	44.8 3.0
Feb. 8.6	36.68 .22	34.0 1.0	66.83 .87	28.7 1.9	9.29 .23	50.1 2.2	58.23 .76	48.0 3.3
18.6	36.89 +.18	33.2 −0.6	67.62 +.60	30.9 +2.4	9.50 +.19	52.2 −2.0	58.90 +.59	51.5 −3.6
28.6	37.04 .14	32.7 −0.3	68.23 .51	33.5 2.7	9.66 .15	54.2 1.8	59.42 .43	55.2 3.7
Mar. 10.5	37.16 .10	32.5 0.0	68.65 .31	36.3 2.9	9.79 .10	55.9 1.6	59.76 .26	59.0 3.8
20.5	37.24 .06	32.6 +0.2	68.86 +.11	39.3 3.1	9.87 .07	57.4 1.4	59.93 +.09	62.8 3.8
30.5	37.28 +.02	32.9 0.4	68.86 −.09	42.4 3.0	9.92 +.03	58.7 1.2	59.94 −.08	66.6 3.7
Apr. 9.5	37.28 −.01	33.4 +0.6	68.67 −.28	45.4 +2.9	9.93 .00	59.7 −0.9	59.78 −.23	70.3 −3.6
19.4	37.25 .04	34.0 0.7	68.31 .44	48.2 2.6	9.92 −.03	60.5 0.7	59.47 .38	73.8 3.3
29.4	37.20 .06	34.8 0.8	67.79 .58	50.7 2.3	9.88 .05	61.1 0.5	59.02 .52	77.0 3.0
May 9.4	37.14 .07	35.6 0.8	67.14 .70	52.9 1.9	9.82 .07	61.5 0.3	58.43 .64	79.8 2.7
19.3	37.06 .08	36.4 0.8	66.38 .79	54.5 1.4	9.74 .08	61.6 −0.1	57.73 .75	82.3 2.2
29.3	36.96 −.09	37.2 +0.8	65.56 −.85	55.7 +0.9	9.65 −.09	61.6 +0.1	56.94 −.84	84.3 −1.8
June 8.3	36.87 .10	38.0 0.7	64.68 .88	56.3 +0.3	9.55 .10	61.4 0.3	56.06 .90	85.9 1.3
18.3	36 77 .10	38.7 0.6	63.79 .89	56.4 −0.2	9.45 .11	60.9 0.5	55.12 .95	86.9 0.7
28.2	36.67 .10	39.2 0.5	62.91 .87	55.9 0.8	9.34 .11	60.4 0.6	54.15 .97	87.4 −0.2
July 8.2	36.57 .10	39.7 0.4	62.06 .82	54.9 1.3	9.23 .11	59.6 0.8	53.17 .97	87.3 +0.3
18.2	36.48 −.09	40.1 +0.3	61.26 −.76	53.3 −1.8	9.12 −.10	58.8 +0.9	52.21 −.94	86.6 +0.9
28.2	36.40 .08	40.3 +0.2	60.54 .68	51.3 2.2	9.02 .09	57.9 1.0	51.30 .88	85.5 1.4
Aug. 7.1	36.33 .06	40.4 0.0	59.91 .58	48.9 2.7	8.93 .08	56.8 1.0	50.46 .78	83.8 1.9
17.1	36.27 .04	40.3 −0.2	59.38 .47	46.0 3.0	8.86 .06	55.8 1.0	49.73 .66	81.7 2.3
27.1	36.24 −.02	40.1 0.4	58.98 .34	42.8 3.3	8.81 .04	54.8 1.0	49.14 .51	79.3 2.6
Sept. 6.0	36.23 +.01	39.6 −0.6	58.71 −.20	39.4 −3.5	8.78 −.01	53.8 +0.9	48.71 −.34	76.5 +2.8
16.0	36.25 .04	38.9 0.8	58.58 −.05	35.7 3.7	8.78 +.02	53.0 0.7	48.46 −.15	73.6 3.0
26.0	36.31 .07	38.0 1.0	58.61 +.10	31.9 3.8	8.83 .06	52.4 0.5	48.40 +.05	70.5 3.0
Oct. 6.0	36.40 .11	36.8 1.3	58.79 .27	28.1 3 8	8.91 .10	51.9 +0.3	48.56 .26	67.6 2.9
15.9	36.54 .15	35.4 1.5	59.14 .43	24.3 3.8	9.03 .15	51.8 0.0	48.93 .47	64.8 2.7
25.9	36.71 +.19	33.8 −1.7	59.65 +.59	20.6 −3.6	9.20 +.19	52.0 −0.3	49.50 +.67	62.2 +2.3
Nov. 4.9	36.93 .23	32.0 1.9	60.32 .75	17.1 3.4	9.42 .23	52.5 0.7	50.26 .84	60.1 1.9
14.9	37.18 .27	29.9 2.1	61.15 .89	13.9 3.0	9.68 .27	53.4 1.0	51.19 .99	58.4 1.4
24.8	37.47 .30	27.8 2.2	62.11 1.02	11.0 2.6	9.97 .30	54.6 1.4	52.25 1.11	57.3 0.8
Dec. 4.8	37.78 .32	25.5 2.2	63.19 1.12	8.7 2.1	10.29 .33	56.1 1.7	53.40 1.19	56.8 +0.2
14.8	38.12 +.34	23.3 −2.2	64.34+1.19	6.8 −1.5	10.62 +.34	58.0 −1.9	54.62+1.22	56.9 −0.5
24.7	38.46 .34	21.1 2.1	65.56 1.22	5.6 0.9	10.97 .34	60.0 2.1	55.85 1.22	57.7 1.1
34.7	38.80 +.33	19.0 −2.0	66.79+1.23	5.0 −0.3	11.31 +.33	62.3 −2.3	57.06+1.18	59.1 −1.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Virginis.		α¹ Crucis.		β Corvi.		κ Draconis.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 12 14	° ′ − 0 3	h m 12 20	° ′ −62 28	h m 12 28	° ′ −22 47	h m 12 28	° ′ +70 23
	s	″	s	″	s	″	s	″
(Dec. 30.7)	15.81 +.33	14.6 −2.1	28.24 +.58	57.6 −1.7	35.57 +.35	4.9 −2.1	46.34 +.78	27.5 −1.0
Jan. 9.7	16.13 .32	16.7 2.0	28.80 .55	59.5 2.2	35.92 .34	7.1 2.3	47.12 .77	26.8 −0.4
19.7	16.44 .30	18.7 1.9	29.33 .51	61.9 2.6	36.25 .32	9.5 2.4	47.88 .74	26.8 +0.3
29.7	16.72 .27	20.5 1.7	29.82 .46	64.7 3.0	36.55 .29	11.9 2.4	48.60 .68	27.4 0.9
Feb. 8.6	16.97 .23	22.0 1.4	30.24 .39	67.9 3.2	36.82 .25	14.3 2.3	49.24 .60	28.6 1.5
18.6	17.18 +.19	23.4 −1.2	30.59 +.31	71.2 −3.4	37.05 +.21	16.6 −2.2	49.79 +.50	30.3 +2.0
28.6	17.35 .15	24.4 0.9	30.87 .24	74.7 3.5	37.23 .17	18.8 2.1	50.24 .39	32.6 2.4
Mar. 10.5	17.48 .11	25.2 0.6	31.07 .16	78.3 3.5	37.38 .13	20.8 1.9	50.57 .27	35.2 2.7
20.5	17.57 .07	25.7 0.4	31.20 .09	81.8 3.5	37.49 .09	22.7 1.7	50.77 .15	38.0 2.9
30.5	17.63 +.04	25.9 −0.1	31.25 +.02	85.3 3.4	37.55 .05	24.3 1.5	50.86 +.03	40.9 3.0
Apr. 9.5	17.64 +.01	26.0 +0.1	31.24 −.04	88.5 −3.2	37.59 +.02	25.7 −1.3	50.83 −.09	43.9 +3.0
19.4	17.63 −.02	25.8 0.2	31.17 .10	91.6 2.9	37.59 −.01	26.8 1.0	50.68 .19	46.8 2.8
29.4	17.60 .04	25.5 0.4	31.03 .16	94.3 2.6	37.56 .04	27.8 0.8	50.44 .28	49.5 2.5
May 9.4	17.55 .06	25.1 0.5	30.85 .21	96.8 2.2	37.51 .06	28.5 0.6	50.12 .36	51.8 2.1
19.4	17.48 .08	24.6 0.5	30.62 .25	98.8 1.8	37.45 .08	28.9 0.3	49.73 .42	53.8 1.7
29.3	17.39 −.09	24.0 +0.6	30.35 −.29	100.4 −1.4	37.36 −.09	29.1 −0.1	49.28 −.46	55.3 +1.3
June 8.3	17.31 .09	23.4 0.6	30.04 .32	101.6 0.9	37.26 .10	29.2 +0.1	48.80 .49	56.3 0.8
18.3	17.21 .10	22.8 0.6	29.72 .34	102.3 −0.5	37.16 .11	28.9 0.3	48.31 .50	56.8 +0.2
28.2	17.11 .10	22.2 0.6	29.37 .35	102.6 0.0	37.04 .12	28.5 0.5	47.80 .50	56.8 −0.3
July 8.2	17.01 .10	21.5 0.6	29.02 .35	102.3 +0.5	36.92 .12	27.9 0.7	47.30 .49	56.2 0.8
18.2	16.92 −.09	21.0 +0.5	28.67 −.34	101.5 +1.0	36.80 −.12	27.1 +0.9	46.83 −.46	55.1 −1.3
28.2	16.83 .08	20.4 0.5	28.34 .32	100.3 1.4	36.69 .11	26.1 1.0	46.38 .42	53.5 1.8
Aug. 7.1	16.75 .07	20.0 0.4	28.03 .29	98.7 1.8	36.58 .10	25.1 1.1	45.98 .37	51.5 2.3
17.1	16.69 .05	19.7 0.3	27.76 .25	96.7 2.2	36.48 .08	23.9 1.2	45.64 .31	49.0 2.7
27.1	16.64 .03	19.5 +0.1	27.53 .19	94.4 2.4	36.41 .06	22.7 1.2	45.36 .25	46.2 3.0
Sept. 6.1	16.62 −.01	19.4 0.0	27.38 −.12	91.8 +2.6	36.36 −.03	21.5 +1.1	45.15 −.17	43.0 −3.3
16.0	16.62 +.02	19.6 −0.2	27.29 −.04	89.2 2.7	36.35 .00	20.4 1.0	45.03 −.08	39.6 3.5
26.0	16.67 .06	19.9 0.5	27.29 +.04	86.5 2.6	36.37 +.04	19.4 0.8	44.99 +.01	36.0 3.7
Oct. 6.0	16.74 .10	20.5 0.7	27.37 .13	83.9 2.5	36.43 .09	18.7 0.6	45.05 .11	32.2 3.8
15.9	16.86 .14	21.4 1.0	27.55 .22	81.5 2.3	36.54 .13	18.2 +0.3	45.22 .22	28.4 3.8
25.9	17.02 +.18	22.5 −1.3	27.82 +.31	79.4 +1.9	36.70 +.18	18.0 0.0	45.49 +.32	24.6 −3.7
Nov. 4.9	17.22 .22	23.9 1.5	28.17 .39	77.7 1.5	36.91 .23	18.1 −0.3	45.87 .43	21.0 3.5
14.9	17.47 .26	25.5 1.8	28.60 .46	76.4 1.0	37.16 .27	18.6 0.7	46.35 .52	17.5 3.3
24.8	17.75 .29	27.4 2.0	29.10 .52	75.7 +0.4	37.45 .30	19.5 1.1	46.92 .61	14.4 3.0
Dec. 4.8	18.05 .32	29.4 2.1	29.65 .56	75.6 −0.2	37.77 .33	20.8 1.4	47.57 .69	11.6 2.5
14.8	18.38 +.33	31.6 −2.2	30.22 +.58	76.1 −0.8	38.11 +.34	22.4 −1.7	48.29 +.74	9.4 −2.0
24.8	18.72 .33	33.8 2.2	30.81 .59	77.2 1.4	38.46 .35	24.3 2.0	49.05 .77	7.7 1.4
34.7	19.05 +.32	35.9 −2.1	31.40 +.58	78.9 −1.9	38.82 +.34	26.4 −2.2	49.84 +.78	6.6 −0.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	32^2 Camelop. (H.)		α Can. Venaticorum.		θ Virginis.		α Virginis. (*Spica.*)	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 12 48	° ′ +84 0	h m 12 50	° ′ +38 54	h m 13 4	° ′ − 4 56	h m 13 19	° ′ −10 35
	s	″	s	″	s	″	s	″
(Dec. 30.8)	18.14+2.22	25.0 −0.9	51.86 +.39	37.7 −1.9	14.05 +.33	58.9 −2.1	22.57 +.33	4.5 −2.0
Jan. 9.7	20.40 2.25	24.4 −0.3	52.25 .39	36.1 1.4	14.39 .33	61.0 2.1	22.90 .33	6.6 2.1
19.7	22.64 2.20	24.5 +0.4	52.64 .38	34.9 0.9	14.71 .31	63.1 2.0	23.23 .32	8.6 2.0
29.7	24.79 2 06	25.2 1.0	53.01 .35	34.2 −0.4	15.02 .29	65.0 1.8	23.55 .30	10.6 2.0
Feb. 8.6	26.76 1.85	26.5 1.6	53,34 .31	34.1 +0.1	15.30 .26	66.8 1.6	23.84 .27	12.5 1.8
18.6	28.49+1.58	28.4 +2.1	53.63 +.27	34.5 +0.6	15.55 +.23	68.3 −1.4	24.10 +.24	14.3 −1.6
28.6	29.92 1.25	30.8 2.5	53.88 .22	35.4 1.1	15.76 .20	69.6 1.2	24.32 .21	15.8 1.4
Mar. 10.6	31.00 .89	33.5 2.8	54.08 .17	36.7 1.5	15.94 .16	70.7 0.9	24.52 .17	17.1 1.2
20.5	31.70 .51	36.5 3.0	54.23 .12	38.3 1.8	16.08 .12	71.5 0.7	24.67 .14	18.2 1.0
30.5	32.02 +.11	39.6 3.1	54.32 .07	40.2 2.0	16.18 .09	72.1 0.4	24.79 .10	19.1 0.8
Apr. 9.5	31.93 −.26	42.7 +3.0	54.37 +.03	42.3 +2.1	16.25 +.05	72.4 −0.2	24.88 +.07	19.8 −0.6
19.5	31.49 .62	45.7 2.9	54.38 −.01	44.4 2.1	16.29 +.02	72.5 0.0	24.93 .04	20.2 0.4
29.4	30.69 .95	48.4 2.6	54.34 .05	46.6 2.1	16.30 .00	72.4 +0.1	24.96 +.01	20.5 −0.2
May 9.4	29.58 1.24	50.9 2.2	54.27 .08	48.6 2.0	16.29 −.02	72.2 0.3	24.96 −.01	20.6 0.0
19.4	28.21 1.47	52.9 1.8	54.18 .11	50.5 1.8	16.26 .04	71.9 0.4	24.94 .03	20.5 +0.1
29.3	26.64−1.66	54.4 +1.3	54.08 −.13	52.2 +1.5	16.20 −.06	71.5 +0.5	24.90 −.05	20.3 +0.2
June 8.3	24.90 1.78	55.4 0.7	53.93 .14	53.5 1.2	16.14 .08	71.0 0.5	24.84 .07	20.1 0.3
18.3	23.07 1.86	55.9 +0.2	53.78 .15	54.5 0.9	16.05 .09	70.5 0.5	24.76 .08	19.7 0.4
28.3	21.19 1.88	55.8 −0.4	53.62 .16	55.2 0.5	15.96 .10	69.9 0.6	24.67 .10	19.2 0.5
July 8.2	19.30 1.86	55.2 0.9	53.46 .16	55.5 +0.1	15.86 .10	69.3 0.6	24.57 .11	18.7 0.5
18.2	17.47−1.79	54.0 −1.5	53.30 −.16	55.4 −0.3	15.75 −.11	68.7 +0.6	24.46 −.11	18.2 +0.6
28.2	15.74 1.67	52.3 1.9	53.14 .15	55.0 0.6	15.64 .11	68.2 0.5	24.35 .11	17.6 0.6
Aug. 7.2	14.13 1.52	50.1 2.4	53.00 .14	54.1 1.0	15.54 .10	67.6 0.5	24.23 .11	17.0 0.6
17.1	12.70 1.33	47.5 2.8	52.87 .12	52.9 1.4	15.44 .09	67.2 0.4	24.12 .10	16.4 0.6
27.1	11.47 1.11	44.5 3.2	52.76 .10	51.4 1.7	15.35 .07	66.8 0.3	24.02 .09	15.8 0.5
Sept. 6.1	10.48 −.86	41.2 −3.5	52.67 −.07	49.5 −2.1	15.29 −.05	66.5 +0.2	23.94 −.07	15.3 +0.4
16.0	9.75 .59	37.6 3.7	52.62 −.03	47.3 2.3	15.24 −.02	66.4 0.0	23.89 −.04	14.9 0.3
26.0	9.30 −.29	33.8 3.8	52.61 +.01	44.8 2 6	15.24 +.01	66.5 −0.2	23.86 .00	14.7 +0.1
Oct. 6.0	9.16 +.01	29.9 3.9	52.64 .06	42.0 2.8	15.26 .05	66.8 0.4	23.87 +.03	14.7 −0.1
16.0	9.33 .34	26.0 3.9	52.72 .11	39.1 3.0	15.33 .09	67.4 0.7	23.93 .06	14.8 0.3
25.9	9.84 +.67	22.2 −3.8	52.85 +.16	36.0 −3.1	15.45 +.14	68.2 −0.9	24.03 +.12	15.3 −0.6
Nov. 4.9	10.67 .99	18.5 3 6	53.04 .21	32.8 3.2	15.61 .18	69.3 1.2	24.18 .17	16.0 0.9
14.9	11.82 1.30	15.0 3.3	53.27 .26	29.7 3.1	15.81 .22	70.6 1.5	24.38 .22	17.0 1.1
24.9	13.27 1.59	11.8 2.9	53.56 .31	26.6 3.0	16.06 .26	72.2 1.7	24.61 .26	18.3 1.4
Dec. 4.8	14.99 1.84	9.1 2.5	53.89 .35	23.6 2.8	16.34 .30	74.0 1.9	24.89 .29	19.8 1.6
14.8	16.94+2.03	6.8 −2.0	54.25 +.37	20.9 −2.5	16.65 +.32	76.0 −2.0	25.20 +.32	21.6 −1.8
24.8	19.06 2.17	5.2 1.4	54.63 .39	18.5 2.2	16.98 .33	78.1 2.1	25.53 .33	23.5 2.0
34.8	21.28+2.25	4.1 −0.7	55.03 +.40	16.5 −1.7	17.32 +.34	80.2 −2.2	25.86 +.34	25.5 −2.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Virginis.		η Ursæ Majoris.		η Bootis.		β Centauri.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	$13^h\ 29^m$	$-0^\circ\ 1'$	$13^h\ 43^m$	$+49^\circ\ 51'$	$13^h\ 49^m$	$+18^\circ\ 56'$	$13^h\ 56^m$	$-59^\circ\ 50'$
	s	″	s	″	s	″	s	″
(Dec.30.8)	3.94 +.33	54.8 −2.2	10.95 +.43	35.0 −2.3	25.42 +.33	56.3 −2.4	1.42 +.56	9.2 −0.5
Jan. 9.8	4.27 .33	56.9 2.1	11.39 .44	33.0 1.8	25.75 .34	54.1 2.1	1.99 .56	9.9 1.0
19.7	4.60 .32	58.9 1.9	11.84 .44	31.5 1.2	26.09 .33	52.1 1.8	2.55 .56	11.2 1.5
29.7	4.91 .30	60.8 1.7	12.27 .43	30.6 −0.6	26.42 .32	50.5 1.4	3.10 .54	12.9 1.9
Feb. 8.7	5.20 .28	62.4 1.5	12.69 .40	30.3 0.0	26.74 .30	49.4 1 0	3.62 .50	15.0 2.3
18.7	5.47 +.25	63.8 −1.2	13.07 +.36	30.7 +0.6	27.02 +.27	48.6 −0.5	4.10 +.46	17.5 −2.6
28.6	5.70 .21	64.8 0.9	13.41 .32	31.6 1.2	27.28 .24	48.3 −0.1	4.54 .41	20.2 2.8
Mar.10.6	5.90 .18	65.6 0.6	13.70 .26	33.0 1.7	27.50 .20	48.4 +0.3	4.92 .35	23.0 2.9
20.6	6.06 .14	66.1 0.4	13.94 .21	34.9 2.1	27.69 .17	48.9 0.6	5.24 .29	26.0 3.0
30.5	6.19 .11	66.4 −0.1	14.11 .15	37.1 2.4	27.84 .13	49.7 0.9	5.50 .23	29.1 3.1
Apr. 9.5	6.28 +.08	66.4 +0.1	14.23 +.09	39.6 +2.6	27.95 +.10	50.8 +1.2	5.71 +.17	32.2 −3.0
19.5	6.34 .05	66.2 0.3	14.30 +.04	42.2 2.6	28.03 .06	52.1 1.4	5.85 .11	35.2 2.9
29.5	6.38 +.02	65.8 0.4	14.31 −.01	44.9 2.6	28.07 +.03	53.5 1.5	5.93 +.05	38.1 2.8
May 9.4	6.38 .00	65.3 0.5	14.27 .06	47.5 2.5	28.09 .00	55.0 1.5	5.95 .00	40.8 2.6
19.4	6.37 −.03	64.7 0.6	14.19 .10	49.9 2.3	28.08 −.02	56.5 1.5	5.92 −.06	43.3 2.4
29.4	6.33 −.05	64.1 +0.7	14.07 −.14	52.1 +2.0	28.04 −.05	57.9 +1.4	5.83 −.11	45.6 −2.1
June 8.4	6.28 .06	63.4 0.7	13.91 .17	54.0 1.7	27.98 .07	59.3 1.3	5.69 .16	47.5 1.8
18.3	6.21 .08	62.7 0.7	13.73 .19	55.5 1.3	27.91 .09	60.5 1.1	5.51 .21	49.1 1.4
28.3	6.12 .09	62.1 0.6	13.52 .21	56.7 0.9	27.81 .10	61.5 0.9	5.27 .25	50.3 1.0
July 8.3	6.02 .10	61.5 0.6	13.30 .23	57.4 +0.5	27.70 .12	62.3 0.7	5.01 .28	51.0 0.5
18.2	5.91 −.11	60.9 +0.5	13.07 −.23	57.6 0.0	27.58 −.13	62.8 +0.4	4.71 −.31	51.4 −0.1
28.2	5.80 .11	60.4 0.4	12.84 .23	57.3 −0.5	27.45 .13	63.1 +0.2	4.39 .32	51.3 +0.3
Aug. 7.2	5.69 .11	60.0 0.4	12.60 .23	56.6 0.9	27.32 .13	63.2 −0.1	4.07 .32	50.7 0.8
17.2	5.57 .10	59.7 0.2	12.38 .22	55.5 1.4	27.19 .13	63.0 0.4	3.75 .31	49.7 1.2
27.1	5.47 .09	59.6 +0.1	12.17 .20	53.9 1.8	27.06 .12	62.5 0.6	3.45 .28	48.3 1.6
Sept. 6.1	5.39 −.07	59.6 −0.1	11.99 −.17	51.9 −2.2	26.95 −.10	61.7 −0.9	3.18 −.24	46.6 +1.9
16.1	5.32 .05	59.7 0.3	11.83 .13	49.5 2.6	26.87 .07	60.6 1.2	2.96 .19	44.6 2.1
26.1	5.29 −.02	60.1 0.5	11.72 .09	46.7 2.9	26.81 −.04	59.2 1.5	2.80 .12	42.3 2.3
Oct. 6.0	5.29 +.02	60.7 0.7	11.66 −.04	43.7 3.2	26.78 .00	57.6 1.8	2.71 −.05	40.0 2.4
16.0	5.34 .06	61.5 0.9	11.65 +.02	40.4 3.4	26.80 +.04	55.7 2.0	2.71 +.04	37.6 2.3
26.0	5.42 +.11	62.5 −1.2	11.70 +.09	36.9 −3.5	26.86 +.08	53.5 −2.3	2.79 +.13	35.3 +2.2
Nov. 5.0	5.56 .16	63.9 1.4	11.82 .15	33.3 3.6	26.97 .13	51.2 2.5	2.97 .22	33.2 2.0
14.9	5.74 .20	65.4 1.7	12.01 .22	29.7 3.6	27.12 .18	48.6 2.6	3.23 .31	31.4 1.7
24.9	5.96 .24	67.2 1.9	12.25 .28	26.2 3.5	27.33 .23	46.0 2.7	3.58 .39	29.9 1.3
Dec. 4.9	6.23 .28	69.2 2.0	12.56 .33	22.8 3.3	27.58 .27	43.3 2.7	4.01 .45	28.9 0.8
14.8	6.52 +.31	71.3 −2.1	12.92 +.37	19.6 −3.0	27.86 +.30	40.6 −2.6	4.49 +.51	28.3 +0.3
24.8	6.84 .32	73.4 2.2	13.32 .41	16.8 2.6	28.18 .32	38.0 2.5	5.02 .54	28.3 −0.2
34.8	7.17 +.33	75.6 −2.1	13.75 +.44	14.4 −2.1	28.51 +.34	35.6 −2.3	5.58 +.57	28.8 −0.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Draconis.		α Bootis. (*Arcturus.*)		θ Bootis.		ρ Bootis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 14 1	° ′ +64 53	h m 14 10	° ′ +19 44	h m 14 21	° +52 21	h m 14 27	° ′ +30 50
	s	″	s	″	s	″	s	″
(Dec.30.8)	22.92 +.58	54.1 −2.3	37.12 +.32	77.5 −2.5	25.45 +.42	24.1 −2.7	3.80 +.33	71.3 −2.6
Jan. 9.8	23.52 .61	52.0 1.7	37.45 .33	75.1 2.2	25.88 .44	21.7 2.1	4.14 .35	68.9 2.3
19.8	24.13 .61	50.6 1.1	37.79 .33	73.1 1.9	26.33 .45	19.8 1.6	4.49 .36	66.8 1.9
29.7	24.74 .61	49.9 −0.4	38.12 .32	71.4 1.5	26.79 .45	18.5 0.9	4.85 .35	65.2 1.4
Feb. 8.7	25.34 .58	49.8 +0.2	38.43 .31	70.1 1.1	27.23 .43	17.9 −0.3	5.19 .33	64.0 0.9
18.7	25.90 +.53	50.4 +0.9	38.73 +.28	69.2 −0.6	27.65 +.40	17.9 +0.3	5.51 +.31	63.5 −0.3
28.7	26.41 .47	51.5 1.5	39.00 .25	68.8 −0.2	28.04 .36	18.5 0.9	5.82 .28	63.4 +0.2
Mar. 10.6	26.84 .40	53.3 2.0	39.24 .22	68.8 +0.2	28.38 .32	19.7 1.5	6.08 .25	63.9 0.7
20.6	27.20 .31	55.5 2.4	39.44 .19	69.2 0.6	28.67 .26	21.4 1.9	6.31 .21	64.8 1.1
30.6	27.47 .23	58.1 2.7	39.61 .15	70.0 0.9	28.91 .21	23.6 2.3	6.51 .17	66.1 1.5
Apr. 9.5	27.66 +.14	60.9 +2.9	39.74 +.11	71.1 +1.2	29.08 +.15	26.0 +2.6	6.66 +.14	67.7 +1.8
19.5	27.75 +.05	63.9 3.0	39.83 .08	72.4 1.4	29.20 .09	28.7 2.7	6.78 .10	69.6 2.0
29.5	27.76 −.03	66.9 3.0	39.90 .05	73.8 1.5	29.26 +.03	31.5 2.8	6.86 .06	71.7 2.1
May 9.5	27.68 .11	69.8 2.8	39.93 +.02	75.4 1.6	29.27 −.02	34.3 2.7	6.90 +.03	73.8 2.1
19.4	27.53 .18	72.5 2.6	39.94 −.01	76.9 1.5	29.23 .07	37.0 2.6	6.91 −.01	76.0 2.1
29.4	27.32 −.25	75.0 +2.3	39.92 −.03	78.5 +1.4	29.13 −.11	39.5 +2.4	6.89 −.04	78.0 +2.0
June 8.4	27.04 .30	77.1 1.9	39.87 .06	79.9 1.3	29.00 .15	41.7 2.1	6.83 .07	79.9 1.8
18.3	26.72 .34	78.8 1.4	39.80 .08	81.1 1.2	28.82 .19	43.6 1.7	6.75 .09	81.6 1.5
28.3	26.36 .38	80.0 1.0	39.71 .10	82.2 1.0	28.62 .22	45.1 1.3	6.65 .12	83.0 1.3
July 8.3	25.96 .40	80.7 +0.5	39.60 .12	83.1 0.7	28.38 .24	46.2 0.8	6.52 .14	84.1 1.0
18.3	25.55 −.42	80.9 −0.1	39.48 −.13	83.7 +0.5	28.13 −.26	46.8 +0.4	6.38 −.15	84.9 +0 6
28.2	25.13 .42	80 6 0.6	39.34 .14	84.1 +0.2	27.86 .27	46.9 −0.1	6.22 .16	85.4 +0.2
Aug. 7.2	24.71 .41	79.7 1.1	39.20 .14	84.2 −0.1	27.59 .27	46.6 0.6	6.05 .17	85.5 −0.1
17.2	24.31 .39	78.4 1.6	39.05 .14	84.0 0.3	27.32 .27	45.8 1.1	5.88 .17	85.2 0.5
27.2	23.93 .36	76.6 2.0	38.91 .13	83.5 0.6	27.05 .26	44.5 1.5	5.71 .16	84.5 0.8
Sept. 6.1	23.58 −.32	74.3 −2.5	38.79 −.12	82.7 −0.9	26.81 −.23	42.7 −2.0	5.55 −.15	83.5 −1.2
16.1	23.28 .27	71.6 2.9	38.68 .10	81.6 1.2	26.59 .20	40.5 2.4	5.42 .13	82.1 1.6
26.1	23.03 .21	68.6 3.2	38.59 .07	80.3 1.5	26.41 .16	38.0 2.8	5.30 .10	80.4 1.9
Oct. 6.0	22.86 .14	65.2 3.5	38.55 −.03	78.6 1.8	26.28 .11	35.0 3.1	5.22 .06	78.3 2.2
16.0	22.76 −.05	61.6 3.7	38.53 +.01	76.6 2.1	26.20 −.05	31.8 3.3	5.18 −.02	75.9 2.5
26.0	22.75 +.04	57.8 −3.8	38.57 +.06	74.4 −2.3	26.18 +.02	28.3 −3.5	5.19 +.03	73.2 −2.8
Nov. 5.0	22.83 .13	53.9 3.9	38.65 .11	72.0 2.5	26.23 .08	24.7 3.7	5.25 .09	70.4 3.0
14.9	23.01 .22	50.0 3.8	38.79 .16	69.4 2.7	26.35 .15	20.9 3.7	5.37 .14	67.3 3.1
24.9	23.28 .32	46.3 3.7	38.97 .21	66.6 2.8	26.54 .22	17.2 3.7	5.54 .19	64.2 3.1
Dec. 4.9	23.65 .40	42.6 3.5	39.20 .25	63.8 2.8	26.80 .29	13.6 3.5	5.76 .24	61.0 3.1
14.9	24.09 +.48	39.4 −3.1	39.47 +.28	61.0 −2.7	27.12 +.35	10.1 −3.3	6.02 +.28	57.9 −3.0
24.8	24.60 .54	36.5 2.6	39.77 .31	58.3 2.6	27.49 .39	7.0 2.9	6.32 .32	55.0 2.8
34.8	25.16 +.59	34.1 −2.1	40.09 +.33	55.8 −2.4	27.91 +.43	4.3 −2.5	6.65 +.34	52.3 −2.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	5 Ursæ Minoris.		α^1 Centauri.		ε Bootis.		α^2 Libræ.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 14 27	° ′ +76 10	h m 14 32	° ′ −60 22	h m 14 40	° ′ +27 31	h m 14 44	° ′ −15 34
	s	″	s	″	s	″	s	″
(Dec. 30.8)	43.02 +.88	53.8 −2.5	6.29 +.54	42.0 0.0	9.36 +.32	73.7 −2.6	45.72 +.32	54.7 −1.6
Jan. 9.8	43.94 .95	51.7 1.8	6.84 .56	42.3 −0.5	9.69 .34	71.2 2.3	46.04 .33	56.3 1.7
19.8	44.92 .99	50.1 1.2	7.41 .56	43.0 1.0	10.03 .34	69.1 1.9	46.38 .33	58.0 1.7
29.7	45.92 1.00	49.3 −0.5	7.97 .55	44.2 1.4	10.37 .34	67.3 1.5	46.71 .33	59.7 1.7
Feb. 8.7	46.92 .98	49.0 +0.1	8.51 .53	45.8 1.8	10.71 .33	66.1 1.0	47.04 .32	61.4 1.6
18.7	47.89 +.93	49.5 +0.8	9.03 +.50	47.8 −2.1	11.03 +.31	65.3 −0.5	47.35 +.30	63.0 −1.5
28.7	48.78 .84	50.7 1.4	9.51 .46	50.1 2.4	11.33 .28	65.1 0.0	47.63 .27	64.4 1.4
Mar. 10.6	49.57 .73	52.4 1.9	9.94 .41	52.6 2.6	11.60 .25	65.3 +0.5	47.90 .25	65.8 1.2
20.6	50.24 .00	54.5 2.4	10.32 .36	55.3 2.8	11.84 .22	66.0 0.9	48.13 .22	66.9 1.0
30.6	50.76 .45	57.1 2.7	10.65 .30	58.1 2.9	12.04 .18	67.1 1.3	48.34 .19	67.8 0.9
Apr. 9.5	51.13 +.29	60.0 +3.0	10.91 +.24	61.0 −2.9	12.20 +.15	68.6 +1.6	48.51 +.16	68.6 −0.7
19.5	51.34 +.13	63.1 3.1	11.12 .18	63.9 2.9	12.33 .11	70.4 1.8	48.66 .13	69.2 0.5
29.5	51.39 −.03	66.2 3.1	11.27 .12	66.7 2.8	12.43 .08	72.3 2.0	48.77 .10	69.7 0.4
May 9.5	51.28 .19	69.2 3.0	11.36 +.06	69.5 2.7	12.49 .04	74.3 2.0	48.86 .07	70.0 0.2
19.4	51.02 .33	72.1 2.8	11.39 .00	72.1 2.5	12.51 +.01	76.3 2.0	48.92 .04	70.2 −0.1
29.4	50.63 −.45	74.8 +2.5	11.35 −.06	74.5 −2.3	12.51 −.02	78.3 +1.9	48.95 +.02	70.3 0.0
June 8.4	50.12 .57	77.0 2.1	11.26 .12	76.6 2.0	12.47 .05	80.2 1.8	48.95 −.01	70.2 +0.1
18.4	49.49 .67	78.9 1.6	11.11 .18	78.5 1.7	12.41 .08	81.9 1.6	48.93 .04	70.1 0.1
28.3	48.79 .74	80.3 1.1	10.90 .23	80.0 1.3	12.32 .10	83.3 1.3	48.88 .06	70.0 0.2
July 8.3	48.02 .79	81.1 0.6	10.65 .27	81.1 0.9	12.21 .12	84.5 1.0	48.80 .09	69.7 0.3
18.3	47.20 −.83	81.5 +0.1	10.36 −.31	81.8 −0.5	12.07 −.14	85.4 +0.7	48.70 −.11	69.4 +0.3
28.3	46.36 .85	81.4 −0.4	10.01 .33	82.1 −0.1	11.92 .16	86.0 +0.4	48.58 .13	69.1 0.4
Aug. 7.2	45.51 .84	80.6 1.0	9.69 .35	82.0 +0.4	11.76 .16	86.2 0.0	48.45 .14	68.7 0.4
17.2	44.68 .82	79.4 1.5	9.34 .35	81.4 0.8	11.59 .17	86.1 −0.3	48.31 .14	68.2 0.5
27.2	43.87 .78	77.7 2.0	9.00 .33	80.4 1.2	11.43 .16	85.6 0.7	48.16 .14	67.7 0.5
Sept. 6.1	43.13 −.71	75.5 −2.4	8.68 −.30	79.0 +1.6	11.27 −.15	84.8 −1.0	48.02 −.13	67.3 +0.4
16.1	42.45 .63	72.9 2.8	8.40 .26	77.3 1.9	11.13 .13	83.6 1.4	47.90 .11	66.9 0.4
26.1	41.87 .53	69.8 3.2	8.17 .20	75.2 2.1	11.01 .10	82.0 1.7	47.80 .08	66.5 0.3
Oct. 6.1	41.39 .41	66.5 3.5	8.00 .12	73.0 2.2	10.92 .07	80.2 2.0	47.73 .05	66.2 0.2
16.0	41.05 .27	62.9 3.7	7.92 −.04	70.7 2.3	10.87 −.03	78.0 2.3	47.71 −.01	66.1 +0.1
26.0	40.85 −.12	59.1 −3.9	7.93 +.05	68.4 +2.3	10.87 +.02	75.6 −2.6	47.72 +.04	66.1 −0.1
Nov. 5.0	40.80 +.04	55.2 3.9	8.02 .15	66.2 2.1	10.92 .07	72.9 2.8	47.79 .09	66.4 0.4
15.0	40.92 .20	51.2 3.9	8.22 .24	64.2 1.9	11.02 .13	70.0 3.0	47.91 .14	66.9 0.6
24.9	41.21 .37	47.4 3.8	8.50 .33	62.4 1.6	11.17 .18	67.0 3.1	48.08 .19	67.6 0.8
Dec. 4.9	41.65 .52	43.7 3.5	8.87 .40	61.0 1.2	11.37 .23	63.9 3.1	48.29 .24	68.5 1.1
14.9	42.25 +.67	40.3 −3.2	9.31 +.47	60.1 +0.7	11.62 +.27	60.9 −3.0	48.55 +.28	69.7 −1.3
24.8	42.99 .79	37.2 2.7	9.80 .52	59.6 +0.3	11.91 .30	57.9 2.8	48.85 .31	71.1 1.5
34.8	43.84 +.90	34.8 −2.3	10.34 +.55	59.6 −0.2	12.23 +.33	55.2 −2.5	49.16 +.33	72.7 −1.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Ursæ Minoris.		β Bootis.		β Libræ.		μ¹ Bootis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 14 50	° ′ +74 35	h m 14 57	° ′ +40 49	h m 15 11	° ′ − 8 58	h m 15 20	° ′ +37 45
	s	″	s	″	s	″	s	″
(Dec. 30.8)	58.93 +.74	66.7 −2.7	46.35 +.34	22.0 −2.9	3.33 +.30	29.8 −1.7	18.21 +.31	42.1 −3.0
Jan. 9.8	59.71 .82	64.3 2.1	46.70 .36	19.3 2.5	3.63 .31	31.5 1.7	18.53 .33	39.3 2.6
19.8	60.56 .87	62.4 1.5	47.07 .37	17.0 2.0	3.95 .32	33.2 1.7	18.87 .35	36.8 2.2
29.8	61.45 .90	61.2 0.9	47.45 .38	15.2 1.5	4.28 .32	34.9 1.6	19.23 .36	34.9 1.7
Feb. 8.7	62.36 .90	60.7 −0.2	47.83 .37	14.0 0.9	4.60 .31	36.5 1.5	19.60 .36	33.4 1.1
18.7	63.25 +.86	60.8 +0.5	48.19 +.35	13.4 −0.3	4.91 +.30	37.9 −1.3	19.95 +.35	32.6 −0.6
28.7	64.09 .80	61.6 1.1	48.54 .33	13.4 +0.3	5.20 .28	39.1 1.1	20.29 .33	32.3 0.0
Mar. 10.7	64.85 .71	63.0 1.7	48.85 .30	13.9 0.8	5.47 .26	40.1 0.9	20.61 .30	32.6 +0.6
20.6	65.51 .60	65.0 2.2	49.13 .26	15.1 1.3	5.71 .23	40.9 0.7	20.90 .27	33.5 1.1
30.6	66.06 .48	67.4 2.6	49.37 .22	16.6 1.8	5.94 .21	41.5 0.5	21.15 .24	34.8 1.6
Apr. 9.6	66.46 +.34	70.1 +2.9	49.57 +.18	18.6 +2.1	6.13 +.18	41.9 −0.3	21.37 +.20	36.6 +2.0
19.5	66.73 .20	73.1 3.0	49.73 .13	20.8 2.4	6.30 .15	42.0 −0.1	21.55 16	38.7 2.2
29.5	66.86 +.06	76.2 3.1	49.84 .09	23.3 2.5	6.44 .12	42.0 +0.1	21.68 .12	41.1 2.4
May 9.5	66.84 −.08	79.3 3.1	49.91 .05	25.8 2.6	6.55 .10	41.9 0.2	21.78 .08	43.6 2.5
19.5	66.69 .22	82.3 2.9	49.94 +.01	28.4 2.5	6.63 .07	41.6 0.3	21.84 +.04	46.1 2.5
29.4	66.41 −.34	85.1 +2.6	49.92 −.03	30.9 +2.4	6.68 +.04	41.3 +0.3	21.85 .00	48.6 +2.4
June 8.4	66.01 .45	87.6 2.3	49.87 .07	33.2 2.2	6.70 +.01	40.9 0.4	21.83 −.04	51.0 2.3
18.4	65.51 .54	89.7 1.9	49.78 .10	35.3 1.9	6.70 −.02	40.5 0.4	21.77 .08	53.2 2.1
28.4	64.92 .62	91.4 1.5	49.66 .13	37.1 1.6	6.66 .05	40.1 0.4	21.68 .11	55.1 1.8
July 8.3	64.26 .69	92.6 1.0	49.51 .16	38.6 1.3	6.60 .07	39.6 0.4	21.55 .14	56.7 1.4
18.3	63.55 −.73	93.4 +0.5	49.34 −.18	39.7 +0.9	6.51 −.10	39.2 +0.4	21.40 −.17	58.0 +1.1
28.3	62.79 .76	93.5 0.0	49.14 .20	40.3 +0.4	6.40 .12	38.8 0.4	21.22 .19	58.9 0.7
Aug. 7.2	62.02 .76	93.2 −0.6	48.93 .21	40.6 0.0	6.28 .13	38.4 0.4	21.02 .20	59.4 +0.3
17.2	61.24 .77	92.3 1.1	48.72 .22	40.4 −0.4	6.14 .14	38.0 0.3	20.81 .21	59.5 −0.1
27.2	60.48 .74	90.9 1.6	48.50 .22	39.7 0.9	5.99 .14	37.7 0.3	20.60 .21	59.1 0.6
Sept. 6.2	59.76 −.69	89.1 −2.1	48.28 −.20	38.6 −1.3	5.85 −.14	37.5 +0.2	20.38 −.21	58.3 −1.0
16.1	59.09 .63	86.7 2.5	48.09 .18	37.1 1.7	5.71 .12	37.3 +0.1	20.18 .19	57.1 1.4
26.1	58.50 .55	84.0 2.9	47.92 .15	35.2 2.1	5.60 .10	37.2 0.0	20.00 .17	55.5 1.8
Oct. 6.1	58.00 .45	80.9 3.3	47.78 .12	32.9 2.5	5.51 .07	37.3 −0.2	19.85 .14	53.5 2.2
16.1	57.60 .33	77.4 3.6	47.68 .07	30.3 2.8	5.46 −.03	37.5 0.3	19.73 .09	51.1 2.5
26.0	57.34 −.20	73.7 −3.8	47.64 −.02	27.3 −3.1	5.45 +.01	38.0 −0.5	19.66 −.04	48.3 −2.9
Nov. 5.0	57.21 −.05	69.9 3.9	47.65 +.04	24.1 3.3	5.49 .06	38.6 0.7	19.65 +.01	45.4 3.1
15.0	57.23 +.10	65.9 3.9	47.71 .10	20.7 3.5	5.58 .11	39.4 1.0	19.69 .07	42.1 3.3
25.0	57.40 .25	62.0 3.8	47.84 .16	17.2 3.5	5.72 .16	40.5 1.2	19.79 .13	38.8 3.4
Dec. 4.9	57.73 .40	58.2 3.7	48.03 .21	13.7 3.5	5.90 .21	41.8 1.4	19.95 .19	35.3 3.4
14.9	58.20 +.54	54.7 −3.4	48.27 +.26	10.3 −3.3	6.13 +.25	43.3 −1.5	20.16 +.24	31.9 −3.3
24.9	58.80 .66	51.5 3.0	48.56 .31	7.0 3.1	6.40 .28	44.9 1.7	20.43 .28	28.7 3.2
34.8	59.52 +.77	48.7 −2.5	48.89 +.35	4.0 −2.8	6.70 +.31	46.6 −1.7	20.73 +.32	25.6 −3.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ² Ursæ Minoris.		α Coronæ Borealis.		α Serpentis.		ε Serpentis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 15 20	+72° 13′	h m 15 29	+27° 4′	h m 15 38	+ 6° 46′	h m 15 45	+ 4° 48′
	s	″	s	″	s	″	s	″
(Dec.30.9)	51.42 +.58	21.3 −3.0	59.97 +.25	63.3 −2.8	49.02 +.27	20.7 −2.2	17.97 +.26	35.3 −2.2
Jan. 9.8	52.05 .67	18.5 2.5	60.24 .30	60.6 2.6	49.31 .29	18.5 2.1	18.25 .29	33.2 2.1
19.8	52.76 .73	16.2 1.9	60.56 .32	58.2 2.2	49.61 .31	16.4 1.9	18.55 .30	31.2 1.9
29.8	53.52 .77	14.6 1.3	60.89 .33	56.2 1.8	49.92 .31	14.6 1.7	18.86 .31	29.4 1.7
Feb. 8.8	54.31 .79	13.6 −0.7	61.23 .33	54.6 1.3	50.23 .31	13.0 1.4	19.17 .31	27.8 1.4
18.7	55.10 +.77	13.3 0.0	61.56 +.32	53.5 −0.8	50.54 +.30	11.7 −1.1	19.48 +.30	26.5 −1.1
28.7	55.86 .74	13.7 +0.7	61.87 .30	53.0 −0.3	50.84 .29	10.8 0.8	19.78 .29	25.5 0.8
Mar. 10.7	56.57 .67	14.7 1.3	62.17 .28	52.9 +0.2	51.12 .27	10.2 −0.4	20.06 .27	24.9 0.4
20.6	57.21 .59	16.3 1.9	62.44 .26	53.4 0.7	51.38 .25	10.0 0.0	20.32 .25	24.7 −0.1
30.6	57.75 .49	18.4 2.3	62.68 .23	54.3 1.1	51.61 .22	10.2 +0.3	20.56 .23	24.8 +0.2
Apr. 9.6	58.19 +.39	20.9 +2.7	62.89 +.20	55.7 +1.5	51.82 +.20	10.6 +0.6	20.77 +.20	25.1 +0.5
19.6	58.52 .27	23.8 3.0	63.07 .16	57.3 1.8	52.01 .17	11.3 0.8	20.97 .18	25.8 0.7
29.5	58.73 .15	26.8 3.1	63.22 .13	59.3 2.0	52.16 .14	12.3 1.0	21.13 .15	26.6 0.9
May 9.5	58.81 +.01	30.0 3.1	63.33 .09	61.3 2.1	52.29 .11	13.4 1.2	21.27 .12	27.6 1.1
19.5	58.78 −.11	33.1 3.0	63.40 .06	63.5 2.2	52.39 .08	14.6 1.2	21.37 .09	28.7 1.2
29.4	58.62 −.21	36.0 +2.9	63.45 +.02	65.7 +2.1	52.46 +.05	15.9 +1.3	21.45 +.06	29.9 +1.2
June 8.4	58.36 .31	38.8 2.6	63.45 −.01	67.8 2.0	52.49 +.02	17.1 1.2	21.49 +.03	31.1 1.1
18.4	58.00 .41	41.2 2.2	63.43 .04	69.7 1.9	52.50 −.01	18.3 1.2	21.51 .00	32.2 1.1
28.4	57.55 .49	43.3 1.8	63.37 .07	71.5 1.6	52.48 .04	19.5 1.1	21.49 −.03	33.3 1.0
July 8.3	57.02 .56	44.9 1.4	63.28 .10	73.0 1.4	52.43 .07	20.5 1.0	21.44 .06	34.3 0.9
18.3	56.43 −.61	46.1 +0.9	63.17 −.13	74.3 +1.1	52.35 −.09	21.4 +0.8	21.36 −.09	35.1 +0.8
28.3	55.79 .65	46.7 +0.4	63.02 .15	75.2 0.8	52.24 .12	22.1 0.6	21.26 .11	35.8 0.6
Aug. 7.3	55.12 .68	46.9 −0.1	62.86 .17	75.8 0.4	52.11 .14	22.6 0.5	21.14 .13	36.4 0.5
17.2	54.43 .69	46.5 0.7	62.69 .18	76.0 +0.1	51.97 .15	23.0 0.3	21.00 .15	36.8 0.3
27.2	53.74 .68	45.6 1.2	62.50 .18	75.9 −0.3	51.81 .16	23.2 +0.1	20.84 .15	37.0 +0.1
Sept. 6.2	53.07 −.65	44.1 −1.7	62.32 −.18	75.4 −0.7	51.66 −.15	23.1 −0.2	20.69 −.15	37.0 −0.1
16.1	52.44 .61	42.2 2.2	62.15 .17	74.6 1.0	51.51 .14	22.9 0.4	20.54 .14	36.8 0.3
26.1	51.85 .55	39.8 2.6	61.99 .15	73.4 1.4	51.37 .12	22.4 0.6	20.40 .13	36.4 0.5
Oct. 6.1	51.34 .47	37.0 3.0	61.85 .12	71.8 1.8	51.26 .10	21.6 0.9	20.28 .10	35.7 0.8
16.1	50.91 .37	33.9 3.3	61.76 .06	69.8 2.1	51.18 .06	20.7 1.1	20.20 .07	34.9 1.0
26.0	50.59 −.26	30.4 −3.6	61.70 −.03	67.6 −2.4	51.14 −.02	19.4 −1.4	20.15 −.03	33.7 −1.2
Nov. 5.0	50.39 .14	26.7 3.8	61.69 +.02	65.1 2.6	51.14 +.03	17.9 1.6	20.15 +.02	32.4 1.5
15.0	50.31 −.01	22.8 3.9	61.73 .07	62.3 2.8	51.19 .08	16.2 1.8	20.19 .07	30.8 1.7
25.0	50.37 +.13	18.9 3.9	61.83 .12	59.4 3.0	51.29 .13	14.3 2.0	20.29 .12	29.0 1.9
Dec. 4.9	50.57 .26	15.0 3.8	61.98 .17	56.3 3.1	51.44 .18	12.3 2.1	20.44 .17	27.1 2.0
14.9	50.90 +.39	11.3 −3.6	62.18 +.22	53.2 −3.0	51.64 +.22	10.1 −2.2	20.63 +.21	25.0 −2.1
24.9	51.35 .52	7.9 3.3	62.42 .26	50.2 2.9	51.88 .25	7.8 2.2	20.86 .25	22.9 2.1
34.8	51.93 +.64	4.8 −2.9	62.70 +.29	47.3 −2.8	52.15 +.28	5.6 −2.2	21.12 +.28	20.7 −2.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Ursæ Minoris.		ε Coronæ Borealis.		δ Scorpii.		β¹ Scorpii.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	15 47	+78 7	15 53	+27 11	15 53	−22 18	15 59	−19 30
	s	″	s	″	s	″	s	″
(Dec.30.9)	55.66 +.69	47.8 −3.1	0.08 +.26	45.1 −2.9	47.48 +.29	21.1 −0.9	0.21 +.28	6.8 −1.0
Jan. 9.9	56.44 .85	44.9 2.7	0.35 .29	42.3 2.6	47.78 .31	22.0 1.0	0.50 .30	7.9 1.1
19.8	57.35 .97	42.4 2.2	0.66 .31	39.8 2.3	48.11 .33	23.1 1.1	0.82 .32	9.1 1.2
29.8	58.38 1.06	40.5 1.6	0.98 .32	37.6 1.9	48.44 .34	24.3 1.2	1.15 .33	10.3 1.2
Feb. 8.8	59.47 1.11	39.3 0.9	1.31 .33	35.9 1.4	48.78 .34	25.5 1.2	1.48 .33	11.5 1.2
18.8	60.60+1.12	38.7 −0.2	1.64 +.32	34.7 −0.9	49.12 +.33	26.8 −1.2	1.81 +.32	12.7 −1.2
28.7	61.71 1.09	38.8 +0.4	1.95 .31	34.1 −0.4	49.44 .32	27.9 1.1	2.13 .31	13.8 1.1
Mar. 10.7	62.77 1.02	39.5 1.0	2.26 .29	33.9 +0.1	49.75 .30	29.0 1.1	2.43 .30	14.9 1.0
20.7	63.75 .92	40.9 1.6	2.54 .27	34.3 0.6	50.04 .28	30.1 1.0	2.72 .28	15.8 0.8
30.6	64.61 .79	42.8 2.1	2.80 .24	35.1 1.1	50.31 .26	31.0 0.9	2.99 .26	16.6 0.7
Apr. 9.6	65.33 +.64	45.1 +2.5	3.03 +.21	36.4 +1.5	50.56 +.23	31.8 −0.8	3.23 +.23	17.2 −0.6
19.6	65.88 .47	47.8 2.8	3.23 .18	38.0 1.8	50.78 .21	32.5 0.6	3.45 .21	17.8 0.5
29.6	66.26 .29	50.8 3.0	3.40 .15	39.9 2 0	50.97 .18	33.1 0.5	3.65 .18	18.2 0.4
May 9.5	66.46 +.10	53.9 3.1	3.53 .12	42.0 2.1	51.13 .15	33.6 0.5	3.82 .15	18.5 0.3
19.5	66.47 −.08	57.1 3.1	3.63 .08	44.2 2.2	51.27 .12	34.0 0.4	3.95 .12	18.8 0.2
29.5	66.30 −.26	60.1 +3.0	3.70 +.04	46.5 +2.2	51.37 +.08	34.4 −0.3	4.06 +.09	19.0 −0.2
June 8.5	65.95 .43	63.0 2.7	3.72 +.01	48.7 2.1	51.44 .05	34.7 0.3	4.13 .06	19.1 0.1
18.4	65.45 .58	65.6 2.4	3.72 −.02	50.8 2.0	51.47 +.02	34.9 0.2	4.17 +.02	19.2 −0.1
28.4	64.79 .72	67.9 2.1	3.68 .06	52.7 1.8	51.47 −.02	35.1 0.2	4.17 −.01	19.2 0.0
July 8.4	64.01 .83	69.8 1.7	3.60 .09	54.4 1.5	51.43 .05	35.3 −0.1	4.14 .05	19.2 0.0
18.3	63.12 −.93	71.2 +1.2	3.49 −.12	55.8 +1.3	51.36 −.08	35.3 0.0	4.07 −.08	19.2 +0.1
28.3	62.15 1.01	72.1 0.7	3.36 .15	56.9 1.0	51.26 .11	35.3 +0.1	3.97 .11	19.1 0.1
Aug. 7.3	61.11 1.06	72.6 +0.2	3.20 .17	57.7 0.6	51.13 .14	35.2 0.1	3.85 .13	19.0 0.2
17.3	60.03 1.09	72.5 −0.3	3.02 .18	58.1 +0.2	50.98 .16	35.0 0.2	3.71 .15	18.8 0.2
27.2	58.93 1.09	71.9 0.8	2.84 .19	58.1 −0.1	50.82 .16	34.8 0.3	3.55 .16	18.5 0.3
Sept. 6.2	57.85−1.07	70.8 −1.3	2.64 −.19	57.8 −0.5	50.66 −.17	34.4 +0.3	3.39 −.16	18.3 +0.3
16.2	56.80 1.02	69.2 1.8	2.45 .18	57.2 0.9	50.49 .16	34.1 0.4	3.22 .16	17.9 0.3
26.2	55.81 .94	67.1 2.3	2.28 .16	56.1 1.3	50.34 .14	33.6 0.4	3.08 .14	17.6 0.3
Oct. 6.1	54.92 .84	64.6 2.7	2.13 .14	54.6 1.6	50.22 .11	33.2 0.4	2.95 .11	17.3 0.3
16.1	54.14 .71	61.7 3.1	2.01 .10	52.9 2.0	50.13 .07	32.8 0.3	2.86 .07	17.1 0.2
26.1	53.50 −.56	58.4 −3.4	1.93 −.06	50.7 −2.3	50.08 −.02	32.5 +0.3	2.80 −.03	16.9 +0.1
Nov. 5.0	53.02 .39	54.9 3.6	1.89 −.01	48.3 2.6	50.08 +.03	32.3 +0.2	2.80 +.02	16.8 0.0
15.0	52.72 .20	51.2 3.8	1.91 +.04	45.6 2.8	50.13 .08	32.2 0.0	2.84 .07	16.9 −0.2
25.0	52.61 −.01	47.4 3.8	1.98 .10	42.7 3.0	50.24 .13	32.3 −0.2	2.94 .12	17.2 0.4
Dec. 5.0	52.71 +.20	43.5 3.8	2.10 .15	39.7 3.1	50.40 .18	32 7 0.4	3.09 .17	17.7 0.6
14.9	53.01 +.40	39.8 −3.7	2.28 +.20	36.6 −3.1	50.61 +.23	33.2 −0.6	3.30 +.22	18.3 −0.7
24.9	53.50 .58	36.2 3.4	2.50 .24	33.6 3.0	50.86 .27	33.9 0.8	3.54 .26	19.2 0.9
34.9	54.17 +.76	33.0 −3.0	2.76 +.28	30.6 −2.9	51.15 +.31	34.8 −1.0	3.82 +.30	20.1 −1.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	Groombridge 2320.		δ Ophiuchi.		τ Herculis.		η Draconis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 16 5	° ′ +68 5	h m 16 8	° ′ − 3 24	h m 16 16	° ′ +46 34	h m 16 22	° ′ +61 45
	s	″	s	″	s	″	s	″
(Dec. 30.9)	58.18 +.39	51.9 −3.4	32.73 +.25	34.9 −1.7	23.84 +.26	25.6 −3.4	27.55 +.31	40.5 −3.5
Jan. 9.9	58.63 .48	48.7 3.0	33.00 .28	36.7 1.7	24.13 .31	22.4 3.0	27.90 .38	37.2 3.1
19.8	59.15 .55	45.9 2.5	33.29 .30	38.4 1.7	24.46 .34	19.6 2.6	28.31 .44	34.3 2.7
29.8	59.74 .61	43.7 1.9	33.59 .31	40.0 1.6	24.82 .37	17.2 2.1	28.78 .48	31.8 2.2
Feb. 8.8	60.36 .64	42.1 1.3	33.90 .31	41.5 1.4	25.20 .38	15.3 1.6	29.28 .51	29.9 1.5
18.8	61.01 +.65	41.1 −0.6	34.21 +.31	42.7 −1.1	25.59 +.39	14.0 −1.0	29.80 +.52	28.7 −0.9
28.7	61.66 .64	40.8 +0.1	34.51 .30	43.8 0.9	25.98 .38	13.4 −0.3	30.32 .52	28.2 −0.2
Mar. 10.7	62.29 .61	41.2 0.7	34.80 .28	44.5 0.6	26.36 .37	13.4 +0.3	30.84 .50	28.3 +0.4
20.7	62.87 .56	42.3 1.3	35.08 .27	45.0 0.3	26.71 .34	14.0 0.9	31.33 .47	29.0 1.1
30.6	63.40 .49	43.9 1.9	35.33 .25	45.2 −0.1	27.04 .31	15.2 1.5	31.77 .42	30.4 1.7
Apr. 9.6	63.86 +.42	46.1 +2.4	35.57 +.22	45.1 +0.2	27.33 +.27	16.9 +1.9	32.17 +.37	32.4 +2.2
19.6	64.23 .33	48.6 2.7	35.78 .20	44.8 0.4	27.59 .23	19.1 2.3	32.51 .31	34.8 2.6
29.6	64.52 .24	51.5 3.0	35.97 .17	44.4 0.5	27.80 .19	21.6 2.6	32.78 .24	37.5 2.9
May 9.5	64.71 .14	54.6 3.1	36.13 .15	43.8 0.6	27.96 .14	24.3 2.8	32.99 .16	40.5 3.1
19.5	64.80 +.04	57.8 3.2	36.26 .12	43.1 0.7	28.08 .09	27.2 2.9	33.11 .09	43.6 3.1
29.5	64.80 −.05	60.9 +3.1	36.37 +.09	42.3 +0.8	28.15 +.04	30.1 +2.9	33.17 +.02	46.8 +3.1
June 8.5	64.70 .14	64.0 2.9	36.44 .06	41.5 0.8	28.17 −.01	33.0 2.8	33.14 −.06	49.9 3.0
18.4	64 51 .23	66.8 2.7	36.48 +.02	40.7 0.8	28.14 .05	35.7 2.6	33.05 .13	52.8 2.8
28.4	64.23 .31	69.3 2.3	36.48 −.01	39.9 0.7	28.06 .09	38.2 2.4	32.88 .20	55.5 2.5
July 8.4	63.88 .39	71.5 1.9	36.46 .04	39.3 0.7	27.94 .14	40.4 2.1	32.65 .26	57.9 2.2
18.3	63.46 −.45	73.3 +1.5	36.40 −.07	38.6 +0.6	27.77 −.18	42.3 +1.7	32.36 −.32	59.9 +1.8
28.3	62.98 .50	74.6 1.1	36.31 .10	38.1 0.5	27.57 .22	43.8 1.3	32.02 .36	61.5 1.3
Aug. 7.3	62.46 .54	75.5 0.6	36.19 .13	37.6 0.4	27.34 .25	44.9 0.8	31.63 .40	62.6 0.9
17.3	61.90 .57	75.8 +0.1	36.06 .14	37.2 0.3	27.08 .27	45.5 +0.4	31.21 .43	63.2 +0.4
27.2	61.32 .58	75.6 −0.6	35.91 .15	37.0 0.2	26.80 .28	45.6 −0.1	30.77 .45	63.3 −0.2
Sept. 6.2	60.74 −.58	74.9 −1.0	35.75 −.16	36.9 +0.1	26.52 −.28	45.3 −0.6	30.32 −.45	62.9 −0.7
16.2	60.17 .56	73.6 1.5	35.59 .15	36.9 −0.1	26.24 .27	44.5 1.0	29.87 .44	62.0 1.2
26.2	59.63 .52	71.9 2.0	35.44 .14	37.0 0.2	25.97 .26	43.2 1.5	29.44 .41	60.5 1.7
Oct. 6.1	59.13 .47	69.7 2.4	35.32 .11	37.3 0.4	25.72 .23	41.4 2.0	29.04 .38	58.6 2.2
16.1	58.69 .40	67.0 2.8	35.22 .08	37.8 0.6	25.51 .19	39.3 2.4	28.69 .32	56.2 2.6
26.1	58.33 −.32	64.0 −3.2	35.16 −.04	38.4 −0.7	25.35 −.14	36.7 −2.8	28.40 −.26	53.4 −3.0
Nov. 5.0	58.06 .22	60.6 3.5	35.14 +.01	39.3 0.9	25.23 .08	33.7 3.1	28.17 .18	50.2 3.3
15.0	57.89 −.11	57.0 3.7	35.17 .05	40.3 1.1	25.18 −.02	30.5 3.4	28.03 .10	46.7 3.6
25.0	57.83 .00	53.2 3.8	35.25 .10	41.6 1.3	25.19 +.04	27.0 3.5	27.97 −.01	43.0 3.7
Dec. 5.0	57.89 +.11	49.3 3.9	35.37 .15	43.0 1.5	25.27 .11	23.4 3.6	28.00 +.08	39.2 3.8
14.9	58.06 +.23	45.5 −3.8	35.55 +.20	44.6 −1.6	25.41 +.17	19.8 −3.6	28.13 +.17	35.4 −3.8
24.9	58.34 .33	41.8 3.6	35.77 .24	46.3 1.7	25.61 .23	16.2 3.5	28.35 .26	31.6 3.6
34.9	58.73 +.44	38.3 −3.3	36.02 +.27	48.0 −1.8	25.87 +.29	12.7 −3.4	28.65 +.34	28.1 −3.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Scorpii. (*Antares.*)		β Herculis.		A Draconis		ζ Ophiuchi.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 16 22	° ′ −26 11	h m 16 25	° ′ +21 43	h m 16 28	° ′ +69 0	h m 16 31	° ′ −10 20
	s	″	s	″	s	″	s	″
(Dec 30.9)	37.29 +.27	7.0 −0.5	27.38 +.23	45.0 −2.8	8.95 +.35	14.0 −3.5	3.83 +.24	33.7 −1.3
Jan. 9.9	37.58 .30	7.6 0.7	27.63 .26	42.3 2.6	9.36 .45	10.7 3.1	4.09 .27	35.0 1.3
19.8	37.90 .32	8.3 0.8	27.90 .29	39.8 2.3	9.85 .53	7.7 2.7	4.37 .29	36.4 1.3
29.8	38.23 .34	9.2 0.9	28.20 .30	37.6 2.0	10.42 .60	5.3 2.2	4.67 .31	37.7 1.3
Feb. 8.8	38.58 .34	10.1 0.9	28.51 .31	35.8 1.6	11.05 .64	3.4 1.5	4.98 .31	38.9 1.2
18.8	38.92 +.34	11.1 −1.0	28.83 +.31	34.5 −1.1	11.71 +.66	2.2 −0.9	5.29 +.31	40.1 −1.0
28.7	39.26 .33	12.0 1.0	29.14 .31	33.6 0.6	12.37 .66	1.6 −0.2	5.60 .30	41.0 0.8
Mar. 10.7	39.59 .32	13.0 0.9	29.44 .30	33.2 −0.1	13.03 .64	1.7 +0.5	5.91 .29	41.8 0.7
20.7	39.90 .31	13.9 0.9	29.73 .28	33.3 +0.3	13.66 .60	2.5 1.1	6.19 .28	42.3 0.5
30.7	40.20 .29	14.7 0.8	30.00 .26	33.8 0.8	14.24 .55	3.9 1.7	6.47 .26	42.7 −0.2
Apr. 9.6	40.47 +.26	15.5 −0.8	30.24 +.23	34.8 +1.2	14.75 +.47	5.9 +2.2	6.72 +.24	42.8 0.0
19.6	40.72 .24	16.2 0.7	30.47 .21	36.1 1.5	15.18 .39	8.3 2.6	6.96 .22	42.8 +0.1
29.6	40.95 .21	16.9 0.6	30.66 .18	37.8 1.8	15.52 .30	11.0 2.9	7.17 .20	42.6 0.2
May 9.5	41.15 .18	17.5 0.6	30.83 .15	39.7 2.0	15.77 .20	14.1 3.1	7.36 .17	42.3 0.3
19.5	41.32 .15	18.0 0.5	30.96 .12	41.7 2.1	15.92 +.10	17.2 3.2	7.52 .14	41.9 0.4
29.5	41.45 +.12	18.6 −0.5	31.06 +.08	43.8 +2.1	15.96 −.01	20.4 +3.2	7.65 +.11	41.5 +0.5
June 8.5	41.55 .08	19.0 0.5	31.13 .05	45.9 2.1	15.90 .11	23.6 3.1	7.75 .08	41.0 0.5
18.4	41.61 .04	19.5 0.4	31.16 +.01	47.9 2.0	15.75 .20	26.5 2.9	7.81 .04	40.5 0.5
28.4	41.64 +.01	19.9 0.4	31.15 −.03	49.9 1.8	15.50 .29	29.3 2.6	7.83 +.01	40.1 0.4
July 8.4	41.62 −.03	20.2 0.3	31.11 .06	51.6 1.6	15.16 .37	31.7 2.2	7.83 −.03	39.7 0.4
18.4	41.57 −.07	20.5 −0.2	31.03 −.09	53.1 +1.4	14.75 −.45	33.7 +1.8	7.78 −.06	39.3 +0.4
28.3	41.48 .10	20.7 0.2	30.92 .12	54.3 1.1	14.27 .51	35.3 1.4	7.71 .09	38.9 0.3
Aug. 7.3	41.36 .13	20.8 −0.1	30.79 .15	55.3 0.8	13.73 .56	36.4 0.9	7.60 .12	38.6 0.3
17.3	41.22 .16	20.8 +0.1	30.63 .17	55.9 0.5	13.15 .59	37.1 +0.4	7.47 .14	38.3 0.2
27.2	41.05 .17	20.7 0.2	30.45 .18	56.3 +0.1	12.54 .61	37.2 −0.1	7.32 .16	38.1 0.2
Sept. 6.2	40.87 −.18	20.5 +0.3	30.26 −.18	56.2 −0.2	11.92 −.62	36.8 −0.7	7.16 −.16	38.0 +0.1
16.2	40.69 .17	20.2 0.4	30.07 .18	55.9 0.5	11.30 .61	35.9 1.2	6.99 .16	37.9 +0.1
26.2	40.53 .16	19.8 0.4	29.89 .17	55.2 0.9	10.70 .58	34.5 1.7	6.84 .15	37.8 0.0
Oct. 6.1	40.38 .13	19.4 0.5	29.73 .15	54.1 1.2	10.14 .53	32.5 2.2	6.70 .13	37.9 −0.1
16.1	40.26 .10	18.9 0.5	29.60 .12	52.7 1.6	9.64 .47	30.1 2.6	6.59 .10	38.1 0.2
26.1	40.19 −.05	18.4 +0.4	29.50 −.08	51.0 −1.9	9.21 −.39	27.3 −3.0	6.51 −.06	38.4 −0.4
Nov. 5.1	40.16 .00	18.0 0.4	29.44 −.03	49.0 2.2	8.87 .29	24.2 3.3	6.47 −.01	38.8 0.5
15.0	40.18 +.05	17.7 0.3	29.43 +.02	46.6 2.4	8.63 .18	20.7 3.6	6.48 +.04	39.4 0.7
25.0	40.26 .11	17.5 +0.1	29.47 .07	44.1 2.6	8.50 −.07	17.0 3.8	6.54 .09	40.2 0.8
Dec. 5.0	40.40 .16	17.5 −0.1	29.56 .12	41.4 2.7	8.49 +.05	13.1 3.8	6.66 .14	41.1 1.0
14.9	40.58 +.21	17.6 −0.2	29.70 +.17	38.6 −2.8	8.60 +.17	9.3 −3.8	6.82 +.18	42.2 −1.1
24.9	40.82 .25	17.9 0.4	29.89 .21	35.7 2.8	8.82 .28	5.5 3.7	7.02 .22	43.4 1.2
34.9	41.09 +.29	18.4 −0.6	30.12 +.25	32.9 −2.7	9.16 +.39	2.0 −3.4	7.26 +.26	44.7 −1.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Trianguli Australis.		η Herculis.		κ Ophiuchi.		ε Ursæ Minoris.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 16 36	° ′ −68 49	h m 16 39	° ′ +39 7	h m 16 52	° ′ + 9 32	h m 16 57	° ′ +82 12
	s	″	s	″	s	″	s	″
(Dec.30.9)	56.07 +.54	15.5 +1.8	5.24 +.22	49.9 −3.3	25.51 +.21	47.4 −2.3	8.51 +.53	56.0 −3.5
Jan. 9.9	56.66 .62	13.9 1.4	5.48 .27	46.7 3.0	25.74 .24	45.2 2.2	9.20 .82	52.6 3.2
19.9	57.32 .69	12.7 1.0	5.77 .30	43.8 2.7	25.99 .27	43.1 2.0	10.15 1.08	49.6 2.8
29.9	58.04 .73	12.0 0.5	6.09 .33	41.3 2.3	26.27 .28	41.1 1.7	11.35 1.29	47.0 2.3
Feb. 8.8	58.79 .76	11.6 +0.1	6.43 .34	39.3 1.8	26.56 .29	39.5 1.4	12.74 1.46	45.0 1.8
18.8	59.56 +.77	11.7 −0.3	6.78 +.35	37.8 −1.2	26.86 +.30	38.2 −1.2	14.27+1.57	43.5 −1.2
28.8	60.33 .77	12.2 0.7	7.13 .35	36.9 −0.6	27.16 .30	37.2 0.8	15.89 1.63	42.7 −0.5
Mar. 10.7	61.10 .75	13.1 1.0	7.48 .34	36.6 0.0	27.45 .29	36.6 −0.4	17.53 1.62	42.5 +0.2
20.7	61.83 .72	14.3 1.4	7.81 .32	36.9 +0.6	27.74 .28	36.4 0.0	19.12 1.55	43.0 0.8
30.7	62.53 .68	15.9 1.7	8.12 .30	37.8 1.1	28.01 .27	36.6 +0.4	20.62 1.43	44.1 1.4
Apr. 9.6	63.18 +.63	17.8 −2.0	8.41 +.27	39.1 +1.6	28.27 +.25	37.2 +0.7	21.98+1.26	45.8 +1.9
19.6	63.78 .56	19.9 2.2	8.67 .24	41.0 2.0	28.51 .23	38.0 1.0	23.14 1.05	47.9 2.4
29.6	64.31 .49	22.2 2.4	8.89 .20	43.2 2.4	28.73 .20	39.2 1.2	24.07 .80	50.5 2.7
May 9.6	64.76 .41	24.7 2.6	9.09 .16	45.7 2.6	28.92 .18	40.5 1.4	24.74 .54	53.3 2.9
19.5	65.14 .23	27.3 2.6	9.22 .12	48.4 2.7	29.08 .15	42.0 1.5	25.15 +.26	56.4 3.1
29.5	65.42 +.24	30.0 −2.7	9.32 +.08	51.2 +2.8	29.22 +.12	43.6 +1.6	25.27 −.02	59.5 +3.1
June 8.5	65.61 .14	32.7 2.7	9.38 +.04	53.9 2.7	29.32 .08	45.2 1.6	25.11 .30	62.6 3.1
18.5	65.70 +.04	35.3 2.6	9.39 −.01	56.6 2.6	29.38 .05	46.8 1.6	24.68 .57	65.6 2.9
28.4	65.68 −.06	37.9 2.4	9.37 .05	59.1 2.4	29.41 +.01	48.4 1.4	23.98 .82	68.5 2.7
July 8.4	65.57 .16	40.2 2.2	9.29 .09	61.4 2.1	29.41 −.02	49.7 1.3	23.04 1.05	71.0 2.4
18.4	65.37 −.25	42.3 −1.9	9.18 −.13	63.4 +1.8	29.37 −.06	51.0 +1.2	21.88−1.26	73.2 +2.0
28.3	65.07 .33	44.1 1.6	9.03 .17	65.0 1.4	29.29 .09	52.0 1.0	20.53 1.43	75.1 1.6
Aug. 7.3	64.70 .40	45.5 1.2	8.84 .20	66.3 1.0	29.18 .12	52.9 0.8	19.01 1.58	76.5 1.2
17.3	64.26 .46	46.5 0.8	8.63 .22	67.2 0.6	29.05 .14	53.6 0.5	17.37 1.69	77.4 0.7
27.3	63.78 .49	47.0 −0.3	8.40 .24	67.6 +0.2	28.89 .16	54.0 0.3	15.64 1.76	77.8 +0.2
Sept. 6.2	63.27 −.51	47.1 +0.2	8.15 −.25	67.6 −0.2	28.72 −.17	54.1 +0.1	13.86−1.79	77.8 −0.3
16.2	62.77 .50	46.7 0.6	7.90 .24	67.1 0.7	28.55 .17	54.1 −0.2	12.06 1.78	77.2 0.8
26.2	62.28 .47	45.8 1.1	7.66 .23	66.2 1.1	28.38 .17	53.8 0.5	10.29 1.73	76.1 1.3
Oct. 6.2	61.84 .41	44.5 1.5	7.44 .21	64.8 1.6	28.22 .15	53.2 0.7	8.59 1.64	74.6 1.8
16.1	61.46 .33	42.8 1.9	7.24 .18	63.0 2.0	28.08 .12	52.3 1.0	7.01 1.51	72.6 2.2
26.1	61.18 −.23	40.7 +2.2	7.09 −.14	60.8 −2.4	27.98 −.08	51.2 −1.2	5.58−1.33	70.1 −2.6
Nov. 5.1	61.00 −.12	38.5 2 4	6.97 .09	58.3 2.7	27.91 −.04	49.8 1.5	4.35 1.12	67.3 3.0
15.0	60.95 .00	36.0 2.5	6.91 −.03	55.4 3.0	27.89 .00	48.2 1.7	3.35 .87	64.1 3.3
25.0	61.01 +.13	33.6 2.5	6.91 +.03	52.2 3.3	27.92 +.05	46.4 1.9	2.61 .59	60.7 3.5
Dec. 5.0	61.21 .26	31.1 2.4	6.96 .09	48.9 3.4	27.99 .10	44.3 2.1	2.17 −.29	57.1 3.6
15.0	61.53 +.38	28.8 +2.2	7.08 +.15	45.4 −3.4	28.11 +.14	42.1 −2.2	2.03 +.03	53.4 −3.7
24.9	61.97 .49	26.8 1.9	7.25 .20	42.0 3.4	28.28 .19	39.9 2.2	2.21 .33	49.7 3.6
34.9	62.51 +.58	25.0 +1.6	7.47 +.24	38.7 −3.2	28.49 +.24	37.7 −2.2	2.70 +.64	46.2 −3.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*d* Herculis.		a^1 Herculis.		*b* Ophiuchi.		*β* Draconis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 16 57	° ′ +33 43	h m 17 9	° ′ +14 30	h m 17 19	° ′ −24 4	h m 17 27	° ′ +52 22
	s	″	s	″	s	″	s	″
(Dec.30.9)	30.45 +.20	37.1 −3.2	35.68 +.19	57.1 −2.5	36.52 +.22	20.8 −0.3	54.28 +.17	54.5 −3.6
Jan. 9.9	30.68 .24	34.1 3.0	35.89 .23	54.7 2.3	36.76 .26	21.2 0.4	54.48 .23	50.9 3.4
19.9	30.94 .28	31.2 2.7	36.14 .25	52.4 2.1	37.03 .28	21.6 0.5	54.75 .29	47.6 3.1
29.9	31.23 .30	28.6 2.3	36.40 .27	50.4 1.9	37.33 .30	22.1 0.5	55.06 .33	44.7 2.7
Feb. 8.8	31.54 .32	26.5 1.8	36.69 .29	48.6 1.6	37.64 .32	22.7 0.6	55.41 .37	42.2 2.2
18.8	31.87 +.33	24.9 −1.3	36.98 +.30	47.2 −1.2	37.97 +.33	23.2 −0.5	55.80 +.40	40.2 −1.6
28.8	32.20 .33	23.9 0.8	37.28 .30	46.1 0.8	38.30 .33	23.8 0.5	56.20 .41	38.9 1.0
Mar. 10.7	32.53 .32	23.4 −0.2	37.58 .30	45.5 −0.4	38.62 .33	24.3 0.5	56.62 .41	38.2 −0.4
20.7	32.85 .31	23.5 +0.4	37.87 .29	45.4 +0.1	38.95 .32	24.7 0.4	57.03 .41	38.2 +0.3
30.7	33.15 .30	24.2 0.9	38.16 .28	45.6 0.5	39.27 .31	25.1 0.3	57.43 .39	38.8 0.9
Apr. 9.7	33.44 +.27	25.3 +1.4	38.42 +.26	46.3 +0.9	39.57 +.30	25.4 −0.3	57.81 +.36	40.1 +1.5
19.6	33.70 .25	27.0 1.8	38.67 .24	47.3 1.2	39.86 .28	25.6 0.2	58.16 .33	41.8 2.0
29.6	33.93 .22	29.0 2.2	38.90 .22	48.7 1.5	40.13 .26	25.8 0.2	58.47 .29	44.1 2.4
May 9.6	34.13 .18	31.3 2.4	39.11 .19	50.3 1.7	40.38 .23	26.0 0.2	58.73 .24	46.7 2.8
19.6	34.30 .14	33.8 2.6	39.29 .16	52.0 1.8	40.60 .20	26.2 0.2	58.95 .19	49.6 3.0
29.5	34.42 +.11	36.4 +2.6	39.43 +.13	53.9 +1.9	40.79 +.17	26.4 −0.2	59.11 +.13	52.7 +3.1
June 8.5	34.51 .07	39.1 2.6	39.55 .10	55.8 1.9	40.95 .14	26.6 0.2	59.22 .07	55.8 3.2
18.5	34.55 +.02	41.6 2.5	39.62 .06	57.7 1.8	41.07 .10	26.8 0.2	59.26 +.02	59.0 3.1
28.4	34.55 −.02	44.1 2.4	39.66 +.02	59.5 1.7	41.14 .06	27.0 0.2	59.25 −.04	62.0 3.0
July 8.4	34.51 .06	46.4 2.1	39.67 −.02	61.2 1.6	41.18 +.02	27.3 0.2	59.17 .10	64.9 2.7
18.4	34.43 −.10	48.4 +1.9	39.63 −.05	62.7 +1.4	41.17 −.03	27.5 −0.3	59.04 −.16	67.5 +2.4
28.4	34.31 .14	50.1 1.6	39.56 .09	64.0 1.2	41.13 .07	27.8 0.2	58.86 .21	69.8 2.1
Aug. 7.3	34.15 .17	51.5 1.2	39.46 .12	65.1 0.9	41.04 .10	28.0 0.2	58.62 .25	71.7 1.7
17.3	33.97 .20	52.5 0.8	39.32 .15	65.9 0.7	40.92 .13	28.2 0.1	58.35 .29	73.1 1.3
27.3	33.76 .22	53.2 +0.4	39.17 .17	66.4 0.4	40.77 .16	28.3 −0.1	58.04 .32	74.2 0.8
Sept. 6.3	33.54 −.23	53.4 0.0	38.99 −.18	66.7 +0.1	40.61 −.17	28.4 0.0	57.70 −.34	74.7 +0.3
16.2	33.31 .23	53.1 −0.4	38.81 .18	66.7 −0.2	40.43 .18	28.3 +0.1	57.36 .35	74.8 −0.2
26.2	33.08 .22	52.5 0.9	38.63 .18	66.4 0.5	40.25 .17	28.2 0.1	57.01 .35	74.3 0.7
Oct. 6.2	32.87 .20	51.4 1.3	38.46 .16	65.8 0.8	40.08 .16	28.1 0.2	56.66 .33	73.3 1.2
16.1	32.68 .17	49.9 1.7	38.30 .14	64.8 1.1	39.93 .13	27.9 0.2	56.35 .30	71.9 1.7
26.1	32.52 −.14	48.0 −2.1	38.18 −.10	63.6 −1.4	39.81 −.10	27.7 +0.2	56.07 −.26	69.9 −2.2
Nov. 5.1	32.41 .09	45.7 2.4	38.10 .06	62.1 1.6	39.73 −.05	27.5 0.2	55.83 .21	67.5 2.6
15.1	32.34 −.04	43.1 2.7	38.05 −.02	60.3 1.9	39.70 .00	27.3 0.1	55.65 .15	64.7 3.0
25.0	32.33 +.01	40.2 3.0	38.06 +.03	58.3 2.1	39.72 +.05	27.1 +0.1	55.53 .08	61.5 3.3
Dec. 5.0	32.37 .07	37.1 3.2	38.11 .08	56.1 2.3	39.79 .10	27.1 0.0	55.48 −.01	58.1 3.5
15.0	32.47 +.12	33.9 −3.2	38.21 +.13	53.7 −2.4	39.92 +.15	27.2 −0.1	55.50 +.06	54.5 −3.6
25.0	32.62 .17	30.7 3.2	38.36 .17	51.2 2.4	40.09 .20	27.4 0.2	55.60 .13	50.9 3.6
34.9	32.82 +.22	27.5 −3.1	38.55 +.21	48.8 −2.4	40.31 +.24	27.7 −0.3	55.76 +.20	47.2 −3.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ophiuchi.		ω Draconis.		μ Herculis.		ψ¹ Draconis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 17 29	° ′ +12 38	h m 17 37	° ′ +68 48	h m 17 42	° +27 46	h m 17 43	° ′ +72 11
	s	″	s	″	s	″	s	″
Jan. 0.0	47.44 +.17	24.9 −2.3	32.27 +.17	27.3 −3.7	6.95 +.15	64.8 −3.0	49.69 +.15	65.6 −3.7
9.9	47.63 .21	22.6 2.2	32.49 .28	23.7 3.5	7.13 .19	61.8 2.9	49.92 .29	61.9 3.5
19.9	47.85 .24	20.4 2.1	32.83 .38	20.3 3.2	7.34 .23	59.0 2.7	50.27 .41	58.5 3.2
29.9	48.11 .26	18.4 1.9	33.25 .47	17.3 2.8	7.59 .26	56.5 2.4	50.74 .52	55.4 2.9
Feb. 8.8	48.38 .28	16.6 1.6	33.77 .54	14.7 2.3	7.86 .28	54.3 2.0	51.31 .61	52.8 2.4
18.8	48.67 +.29	15.2 −1.2	34.34 +.60	12.6 −1.7	8.15 +.30	52.5 −1.5	51.96 +.68	50.6 −1.8
28.8	48.96 .30	14.2 0.8	34.96 .63	11.2 1.1	8.46 .31	51.2 1.0	52.67 .73	49.1 1.2
Mar. 10.8	49.26 .29	13.5 −0.4	35.60 .65	10.5 −0.4	8.77 .31	50.4 −0.5	53.42 .75	48.3 −0.5
20.7	49.55 .29	13.3 0.0	36.25 .64	10.4 +0.2	9.08 .31	50.3 0.0	54.17 .74	48.1 +0.2
30.7	49.84 .28	13.5 +0.4	36.88 .61	10.9 0.9	9.38 .30	50.5 +0.5	54.90 .72	48.6 0.8
Apr. 9.7	50.11 +.27	14.1 +0.8	•37.47 +.57	12.2 +1.5	9.68 +.29	51.3 +1.0	55.60 +.67	49.8 +1.4
19.7	50.38 .25	15.1 1.1	38.02 .51	14.0 2.0	9.96 .27	52.6 1.5	56.24 .60	51.5 2.0
29.6	50.62 .23	16.3 1.4	38.49 .44	16.3 2.5	10.22 .25	54.3 1.8	56.80 .51	53.7 2.4
May 9.6	50.84 .21	17.8 1.6	38.89 .35	19.0 2.8	10.45 .22	56.3 2.1	57.27 .41	56.3 2.8
19.6	51.04 .18	19.5 1.8	39.20 .26	21.9 3.1	10.66 .19	58.5 2.3	57.63 .30	59.2 3.0
29.5	51.20 +.15	21.3 +1.8	39.41 +.16	25.1 +3.2	10.83 +.15	61.0 +2.5	57.87 +.19	62.4 +3.2
June 8.5	51.33 .12	23.2 1.9	39.52 +.06	28.4 3.3	10.96 .12	63.5 2.5	58.00 +.07	65.6 3.3
18.5	51.43 .08	25.1 1.8	39.53 −.04	31.7 3.3	11.06 .08	66.0 2.5	58.01 −.06	68.9 3.2
28.5	51.49 +.04	26.8 1.7	39.43 .15	34.9 3.1	11.11 +.03	68.5 2.4	57.89 .18	72.1 3.1
July 8.4	51.52 .00	28.5 1.6	39.24 .24	37.9 2.9	11.12 −.01	70.8 2.2	57.65 .29	75.1 2.9
18.4	51.50 −.04	30.0 +1.4	38.95 −.33	40.7 +2.6	11.09 −.05	72.9 +2.0	57.30 −.40	77.9 +2 6
28.4	51.45 .07	31.4 1.2	38.57 .42	43.1 2.2	11.02 .09	74.8 1.7	56.85 .50	80.4 2.3
Aug. 7.4	51.35 .11	32.5 1.0	38.12 .49	45.2 1.8	10.91 .13	76.4 1.4	56.30 .59	82.5 1.9
17.3	51.23 .14	33.3 0.7	37.59 .55	46.8 1.4	10.76 .16	77.7 1.1	55.68 .66	84.2 1.5
27.3	51.08 .16	34.0 0.5	37.02 .60	48.0 0.9	10.58 .19	78.6 0.8	54.99 .72	85.4 1.0
Sept. 6.3	50.91 −.17	34.3 +0.2	36.40 −.63	48.7 +0.4	10.39 −.20	79.2 +0.4	54.25 −.75	86 2 +0.5
16.2	50.73 .18	34.4 −0.1	35.76 .64	48.8 −0.1	10.17 .21	79.3 0.0	53.48 .77	86.4 0.0
26.2	50.55 .17	34.2 0.4	35.12 .64	48.4 0.6	9.96 .21	79.1 −0.4	52.70 .77	86.1 −0.5
Oct. 6.2	50.38 .17	33.7 0.6	34.48 .62	47.6 1.1	9.75 .20	78.5 0.8	51.93 .75	85.3 1.1
16.2	50.22 .15	32.9 0.9	33.88 .58	46.1 1.7	9.55 .18	77.5 1.2	51.20 .71	84.0 1.6
26.1	50.09 −.12	31.8 −1.2	33.33 −.52	44.2 −2.2	9.38 −.15	76.1 −1.6	50.52 −.64	82.1 −2.1
Nov. 5.1	49.99 .08	30.5 1.5	32.84 .45	41.8 2.6	9.25 .12	74.3 2.0	49.91 .56	79.8 2.5
15.1	49.93 −.03	28.9 1.7	32.44 .36	39.0 3.0	9.15 .07	72.2 2.3	49.40 .46	77.0 2.9
25.1	49.92 +.01	27.0 2.0	32.13 .25	35.8 3.3	9.10 −.02	69.8 2.6	49.00 .34	73.9 3.3
Dec. 5.0	49.96 .06	25.0 2.1	31.93 .14	32.4 3.6	9.10 +.03	67.1 2.8	48.72 .21	70.5 3.5
15.0	50.04 +.11	22.8 −2.2	31.85 −.02	28.7 −3.7	9.16 +.08	64.2 −2.9	48.58 −.07	66.9 −3.6
25.0	50.17 .15	20.5 2.3	31.88 +.09	25.0 3.7	9.26 .13	61.3 3.0	48.57 +.06	63.1 3.7
35.0	50.34 +.19	18.1 −2.3	32.03 +.21	21.3 −3.6	9.41 +.18	58.3 −2.9	48.71 +.20	59.4 −3.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Draconis.		γ² Sagittarii.		μ Sagittarii.		η Serpentis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	$17^{\mathrm{h}}\ 54^{\mathrm{m}}$	$+51^{\circ}\ 29'$	$17^{\mathrm{h}}\ 58^{\mathrm{m}}$	$-30^{\circ}\ 25'$	$18^{\mathrm{h}}\ 7^{\mathrm{m}}$	$-21^{\circ}\ 5'$	$18^{\mathrm{h}}\ 15^{\mathrm{m}}$	$-2^{\circ}\ 55'$
	s	″	s	′	s	″	s	″
Jan. 0.0	0.50 +.13	64.1 −3.7	41.65 +.19	27.7 +0.3	8.46 +.17	12.7 −0.3	34.67 +.14	36.6 −1.4
9.9	0.66 .19	60.5 3.5	41.86 .23	27.5 0.2	8.64 .21	13.0 0.3	34.83 .18	38.0 1.4
19.9	0.88 .25	57.1 3.2	42.11 .27	27.3 +0.1	8.87 .24	13.3 0.3	35.03 .21	39.3 1.3
29.9	1.16 .30	54.0 2.9	42.39 .29	27.3 0.0	9.12 .27	13.6 0.3	35.25 .23	40.6 1.2
Feb. 8.9	1.48 .34	51.4 2.4	42.70 .31	27.3 0.0	9.40 .29	14 0 0.3	35.50 .25	41.7 1.0
18.8	1.84 +.37	49.2 −1.9	43.02 +.33	27.3 0.0	9.70 +.30	14.3 −0.3	35.76 +.27	42.7 −0.8
28.8	2.22 .39	47.6 1.3	43.36 .34	27.4 −0.1	10.01 .31	14.5 0.2	36.04 .28	43.4 0.6
Mar. 10.8	2.62 .40	46.7 −0.6	43.70 .34	27.5 0.1	10.32 .32	14.7 −0.1	36.33 .29	43.8 −0.3
20.8	3.03 .40	46.4 0.0	44.05 .34	27.6 0.1	10.64 .32	14.8 0.0	36.62 .29	44.0 0.0
30.8	3.43 .39	46.7 +0.7	44.39 .34	27.7 0.1	10.96 .32	14.7 +0.1	36.91 .29	43.9 +0.2
Apr. 9.7	3.81 +.37	47.7 +1.3	44.73 +.33	27.8 −0.1	11.27 +.31	14.6 +0.1	37.20 +.29	43.6 +0.5
19.7	4.18 .35	49.2 1.8	45.06 .32	27.9 0.2	11.58 .30	14.5 0.2	37.49 .28	43.0 0.7
29.6	4.51 .31	51.3 2.3	45.37 .30	28.1 0.2	11.87 .28	14.3 0.2	37.76 .26	42.1 0.9
May 9.6	4.80 .27	53.8 2.6	45.66 .28	28.3 0.2	12.15 .27	14.0 0.2	38.02 .25	41.2 1.0
19.6	5.05 .22	56.6 2.9	45.93 .25	28.6 0.3	12.41 .24	13.8 0.2	38.25 .23	40.1 1.1
29.6	5.25 +.17	59.6 +3.1	46.17 +.22	28.9 −0.4	12.63 +.21	13.6 +0.2	38.47 +.20	38.9 +1.2
June 8.5	5.39 .11	62.8 3.2	46.37 .19	29.3 0.4	12.83 .18	13.4 0.1	38.65 .17	37.7 1.2
18.5	5.47 +.05	66.0 3.2	46.54 .14	29.7 0.5	13.00 .14	13.3 +0.1	38.80 .13	36.6 1.1
28.5	5.50 −.01	69.1 3.1	46.66 .10	30.3 0.5	13.12 .10	13.2 0.0	38.92 .09	35.4 1.1
July 8.5	5.46 .07	72.1 2.9	46.74 .05	30.8 0.6	13.20 .06	13.2 0.0	38.99 .05	34.4 1.0
18.4	5.37 −.12	74.9 +2.6	46.77 +.01	31.4 −0.6	13.24 +.02	13.3 −0.1	39.03 +.01	33.5 +0.9
28.4	5.22 .18	77.4 2.3	46.76 −.04	32.0 0.6	13.23 −.03	13.4 0.1	39.02 −.03	32.7 0.7
Aug. 7.4	5.01 .23	79.6 2.0	46.69 .08	32.6 0.5	13.18 .07	13.5 0.2	38.97 .07	32.0 0.6
17.3	4.76 .27	81.4 1.6	46.59 .12	33.1 0.5	13.09 .11	13.7 0.2	38.89 .10	31.5 0.4
27.3	4.47 .30	82.7 1.1	46.45 .15	33.6 0.4	12.97 .14	13.9 0.2	38.77 .13	31.2 0.3
Sept. 6.3	4.16 −.33	83.6 +0.6	46.28 −.18	33.9 −0.3	12.82 −.16	14.1 −0.2	38.62 −.15	30.9 +0.1
16.3	3.82 .34	84.0 +0.1	46.10 .19	34.1 0.2	12.65 .17	14.3 0.1	38.46 .17	30.9 0.0
26.2	3.47 .34	83.9 −0.4	45.90 .19	34.3 −0.1	12.47 .18	14.4 0.1	38.29 .17	30.9 −0.1
Oct. 6.2	3.13 .33	83.3 0.9	45.71 .18	34.2 +0.1	12.29 .17	14.4 −0.1	38.12 .17	31.1 0.3
16.2	2.81 .31	82.2 1.4	45.54 .16	34.0 0.2	12.13 .15	14.5 0.0	37.96 .15	31.5 0.4
26.2	2.51 −.28	80.5 −1.9	45.39 −.13	33.8 +0.3	11.99 −.13	14.5 0.0	37.82 −.13	32.0 −0.6
Nov. 5.1	2.25 .23	78.4 2.3	45.27 .09	33.4 0.4	11.88 .09	14.5 0.0	37.70 .10	32.7 0.7
15.1	2.05 .18	75.9 2.7	45.20 −.04	33.0 0.5	11.81 −.05	14.5 0.0	37.63 .06	33.5 0.9
25.1	1.90 .12	73 0 3.1	45.18 +.01	32.5 0.5	11.78 .00	14.5 −0.1	37.59 −.01	34.5 1.0
Dec. 5.0	1.82 −.05	69.7 3.3	45.22 .06	32.0 0.4	11.81 +.05	14.6 0.1	37.60 +.03	35.5 1.2
15.0	1.80 +.02	66.2 −3.5	45.31 +.11	31.6 +0.4	11.88 +.10	14.8 −0.2	37.65 +.07	36.8 −1.3
25.0	1.86 .09	62.7 3.6	45.45 .16	31.3 0.3	12.01 .14	15.0 0.2	37.75 .12	38.1 1.3
35.0	1.98 +.15	59.1 −3.7	45.64 +.21	31.0 +0.3	12.17 +.19	15.2 −0.3	37.89 +.16	39.4 −1.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	1 Aquilæ.		α Lyræ. (*Vega.*)		σ Octantis.		β Lyræ.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 18 29	° ′ − 8 19	h m 18 33	° ′ +38 40	h 18	° ′ −89 15	h m 18 45	° ′ +33 13
	s	″	s	″	m s	″	s	″
Jan. 0.0	10.81 +.13	15.2 −1.0	10.46 +.08	51.8 −3.2	40 0.8+ 4.3	61.9 +3.3	58.78 +.08	65.3 −3.0
10.0	10.96 .17	16.2 1.0	10.57 .13	48.6 3.2	40 6.8 7.5	58.7 3.2	58.88 .12	62.2 3.0
19.9	11.15 .20	17.2 0.9	10.73 .18	45.5 3.0	40 15.8 10.4	55.6 3.0	59.03 .17	59.3 2.9
29.9	11.37 .23	18.1 0.9	10.94 .22	42.5 2.8	40 27.7 13.0	52.7 2.7	59.21 .21	56.5 2.7
Feb. 8.9	11.61 .25	18.9 0.8	11.18 .26	39.9 2.4	40 41.9 15.3	50.1 2.4	59.44 .24	54.0 2.3
18.8	11.87 +.27	19.6 −0.6	11.46 +.29	37.7 −2.0	40 58.2+17.1	48.0 +2.0	59.69 +.27	51.8 −1.9
28.8	12.15 .28	20.1 0.4	11.76 .31	36.0 1.5	41 16.1 18.5	46.2 1.5	59.97 .29	50.1 1.4
Mar. 10.8	12.44 .29	20.4 −0.2	12.08 .33	34.8 0.9	41 35.2 19.4	44.9 1.1	60.27 .31	48.9 0.9
20.8	12.73 .30	20.5 0.0	12.41 .34	34.2 −0.3	41 55.0 20.0	44.1 0.6	60.58 .32	48.3 −0.3
30.7	13.03 .30	20.3 +0.3	12.75 .34	34.2 +0.3	42 15.2 20.1	43.7 +0.1	60.90 .32	48.2 +0.2
Apr. 9.7	13.33 +.30	20.0 +0.5	13.08 +.33	34.8 +0.9	42 35.2+19.8	43.9 −0.4	61.23 +.32	48.7 +0.8
19.7	13.62 .29	19.4 0.6	13.41 .32	36.0 1.4	42 54.8 19.1	44.5 0.9	61.54 .31	49.8 1.3
29.7	13.91 .28	18.7 0.8	13.72 .30	37.6 1.9	43 13.4 18.0	45.6 1.3	61.85 .30	51.3 1.7
May 9.6	14.18 .26	17.9 0.9	14.01 .28	39.7 2.3	43 30.8 16.6	47.1 1.7	62.13 .27	53.2 2.1
19.6	14.43 .24	16.9 1.0	14.27 .24	42.2 2.6	43 46.6 14.8	49.1 2.1	62.40 .25	55.5 2.4
29.6	14.66 +.21	15.9 +1.0	14.50 +.21	44.9 +2.8	44 0.4+12.6	51.4 −2.5	62.63 +.22	58.1 +2.6
June 8.5	14.86 .18	15.0 0.9	14.69 .17	47.8 2.9	44 11.8 10.2	54.0 2.7	62.83 .18	60.8 2.8
18.5	15.03 .15	14.1 0.9	14.83 .12	50.8 3.0	44 20.8 7.6	56.8 2.9	62.99 .14	63.7 2.8
28.5	15.16 .11	13.2 0.8	14.93 .07	53.8 2.9	44 27.0 4.7	59.9 3.1	63.10 .09	66.5 2.8
July 8.5	15.26 .07	12.4 0.7	14.98 +.02	56.7 2.8	44 30.2+ 1.8	63.0 3.1	63.17 +.04	69.3 2.7
18.4	15.31 +.03	11.7 +0.6	14.97 −.03	59.5 +2.7	44 30.5− 1.3	66.1 −3.1	63.19 .00	72.0 +2.6
28.4	15.32 −.01	11.2 0.5	14.92 .08	62.0 2.4	44 27.7 4.2	69.1 3.0	63.16 −.05	74.5 2.4
Aug. 7.4	15.28 .05	10.8 0.4	14.82 .12	64.3 2.1	44 22.0 7.1	72.0 2.7	63.09 .10	76.7 2.1
17.4	15.21 .09	10.4 0.3	14.67 .17	66.3 1.8	44 13.5 9.7	74.6 2.4	62.97 .14	78.6 1.8
27.3	15.10 .12	10.2 0.2	14.48 .20	67.9 1.4	44 2.6 12.0	76.8 2.0	62.81 .17	80.2 1.4
Sept. 6.3	14.96 −.15	10.1 +0.1	14.27 −.23	69.1 +1.0	43 49.6−13.8	78.6 −1.5	62.63 −.20	81.4 +1.0
16.3	14.81 .16	10.1 0.0	14.03 .25	69.9 0.6	43 34.9 15.2	79.9 1.0	62.41 .22	82.3 0.6
26.2	14.64 .17	10.2 −0.1	13.77 .26	70.3 +0.1	43 19.2 15.9	80.6 −0.4	62.18 .23	82.7 +0.2
Oct. 6.2	14.47 .17	10.4 0.2	13.51 .25	70.2 −0.3	43 3.0 16.1	80.8 +0.2	61.95 .23	82.7 −0.2
16.2	14.31 .15	10.7 0.3	13.26 .24	69.6 0.8	42 47.0 15.6	80.3 0.8	61.72 .22	82.3 0.7
26.2	14.16 −.13	11.0 −0.4	13.03 −.22	68.5 −1.3	42 31.9−14.4	79.2 +1.4	61.51 −.20	81.4 −1.1
Nov. 5.1	14.04 .10	11.5 0.5	12.82 .19	67.0 1.7	42 18.3 12.6	77.6 1.9	61.32 .17	80.1 1.5
15.1	13.96 .06	12.1 0.6	12.65 .15	65.1 2.1	42 6.7 10.3	75.4 2.4	61.16 .14	78.3 1.9
25.1	13.91 −.02	12.8 0.7	12.53 .10	62.8 2.5	41 57.8 7.5	72.8 2.8	61.04 .10	76.2 2.3
Dec. 5.1	13.92 +.02	13.5 0.8	12.45 −.05	60.1 2.8	41 51.7 4.4	69.9 3.1	60.96 −.05	73.8 2.6
15.0	13.96 +.07	14.4 −0.9	12 42 .00	57.2 −3.0	41 49.0− 1.1	66.7 +3.2	60.94 .00	71.1 −2.8
25.0	14.05 .11	15.3 0.9	12.45 +.06	54.0 3.2	41 49.5+ 2.2	63.4 3.3	60.96 +.05	68.2 2.9
35.0	14.19 +.15	16.3 −1.0	12.54 + 11	50.8 −3.2	41 53.4+ 5.6	60.1 +3.3	61.04 +.10	65.2 −3.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	σ Sagittarii.		50 Draconis.		ζ Aquilæ.		*d* Sagittarii.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 18 48	° ′ −26 25	h m 18 49	° ′ +75 17	h m 19 0	° ′ +13 41	h m 19 11	° ′ −19 8
	s	″	s	″	s	″	s	″
Jan. 0.0	23.90 +.13	60.0 +0.2	50.38 −.10	74.2 −3.5	18.96 +.08	59.5 −2.1	9.32 +.10	56.5 −0.2
10.0	24.06 .17	59.8 0.2	50.37 +.07	70.6 3.5	19.06 .12	57.3 2.1	9.44 .14	56.7 0.2
20.0	24.25 .21	59.6 0.2	50.52 .23	67.0 3.5	19.20 .16	55.2 2.0	9.60 .18	56.9 0.1
29.9	24.48 .24	59.4 0.2	50.84 .39	63.6 3.3	19 37 .19	53.2 1.9	9.80 .21	57.0 −0.1
Feb. 8.9	24.73 .27	59.2 0.2	51.30 .53	60.4 2.9	19.58 .22	51.5 1.7	10.02 .24	57.0 0.0
18.9	25.01 +.29	59.0 +0.2	51.90 +.65	57.7 −2.5	19.81 +.24	49.9 −1.4	10.27 +.26	57.0 +0.1
28.8	25.31 .31	58.7 0.2	52.60 .75	55.5 1.9	20.06 .26	48.8 1.0	10.54 .28	56.9 0.2
Mar. 10.8	25.63 .32	58.5 0.3	53.40 .82	53.9 1.3	20.33 .27	48.0 0.6	10.82 .29	56.7 0.3
20.8	25.95 .33	58.2 0.3	54.24 .86	52.9 −0.7	20.61 .28	47.6 −0.2	11.12 .30	56.4 0.4
30.8	26.28 .33	57.8 0.4	55.12 .88	52.5 0.0	20.90 .29	47.6 +0.2	11.43 .31	55.9 0.5
Apr. 9.7	26.62 +.33	57.5 +0.4	56.00 +.86	52.8 +0.6	21.19 +.29	48.1 +0.7	11.74 +.32	55.4 +0.6
19.7	26.95 .33	57.1 0.4	56.84 .82	53.8 1.2	21.49 .29	49.0 1.1	12.06 .32	54.7 0.7
29.7	27.27 .32	56.7 0.3	57.63 .75	55.3 1.8	21.77 .28	50.2 1.4	12.38 .31	54.0 0.7
May 9.7	27.59 .30	56.4 0.3	58.34 .66	57.3 2.3	22.05 .27	51.7 1.7	12.68 .30	53.3 0.7
19.6	27.88 .28	56.1 0.2	58.94 .54	59.8 2.7	22.31 .25	53.5 1.9	12.98 .28	52.6 0.7
29.6	28.15 +.26	55.9 +0.2	59.42 +.42	62.7 +3.0	22.55 +.23	55.5 +2.0	13.25 +.26	51.9 +0.6
June 8.6	28.40 .23	55 8 +0.1	59.78 .28	65.8 3.2	22.76 .20	57.5 2.1	13.50 .23	51.3 0.6
18.5	28.61 .19	55.8 −0.1	59.99 +.14	69.1 3.3	22.94 .16	59.7 2.1	13.72 .20	50.8 0.5
28.5	28.78 .15	55.9 0.2	60.05 −.01	72.5 3.4	23.08 .12	61.8 2.1	13.90 .16	50.4 0.4
July 8.5	28.90 .10	56.1 0.3	59.97 .16	75.8 3.3	23.19 .08	63.8 2.0	14.04 .12	50.1 0.2
18.5	28.98 +.06	56.4 −0.4	59.73 −.30	79.1 +3.2	23.25 +.04	65.7 +1.8	14.14 +.07	49.9 +0.1
28.4	29.02 +.01	56.8 0.4	59.36 .44	82.2 3.0	23.26 −.01	67.5 1.7	14.19 +.03	49.9 0.0
Aug. 7.4	29.00 −.04	57.3 0.5	58.86 .56	85.0 2.7	23.24 .05	69.1 1.5	14.20 −.02	49.9 −0.1
17.4	28.94 .08	57.8 0.5	58.23 .68	87.5 2.3	23.17 .09	70.4 1.2	14.16 .06	50.1 0.2
27.4	28.84 .12	58.3 0.5	57.50 .77	89.6 1.9	23.06 .12	71.5 1.0	14.07 .10	50.3 0.3
Sept. 6.3	28.70 −.15	58.7 −0.4	56.69 −.85	91.4 +1.5	22.93 −.15	72.3 +0.7	13.96 −.13	50.6 −0.3
16.3	28.54 .17	59.2 0.4	55.80 .91	92.7 1.0	22.77 .17	72.9 0.4	13.81 .15	50.9 0.3
26.3	28.36 .18	59.5 0.3	54.87 .94	93.5 +0.5	22.59 .18	73.2 +0.1	13.65 .17	51.2 0.3
Oct. 6.2	28.17 .18	59 7 0.2	53.92 .95	93.7 0.0	22.41 .18	73.1 −0.2	13.48 .17	51.5 0.3
16.2	27.99 .17	59.9 −0.1	52.96 .94	93.5 −0.5	22.23 .17	72.8 0.5	13.30 .17	51.8 0.3
26.2	27.83 −.15	59.9 0.0	52.03 −.90	92.7 −1.1	22.06 −.16	72.2 −0.8	13.14 −.15	52.0 −0.2
Nov. 5.2	27.69 .12	59.9 +0.1	51.16 .84	91.3 1.6	21.91 .13	71.3 1.1	13.00 .12	52.2 0.2
15.1	27.59 .08	59.8 0.2	50.36 .75	89.5 2.1	21.79 .10	70.1 1.3	12.90 .09	52.4 0.2
25.1	27.53 −.04	59.6 0.2	49.66 .64	87.2 2.6	21.71 .06	68.6 1.6	12.82 .05	52.6 0.2
Dec. 5.1	27.52 +.01	59.4 0.2	49.09 .51	84.4 2.9	21.66 −.02	67.0 1.8	12.79 −.01	52.8 0.2
15.1	27.55 +.06	59.1 +0.2	48.65 −.36	81.3 −3.3	21.66 +.02	65.1 −2.0	12.80 +.03	52.9 −0.2
25.0	27.64 .11	58.9 0.2	48.37 .20	77.9 3.5	21.70 .06	63.0 2.1	12.86 .08	53.1 0.2
35.0	27.77 +.16	58.7 +0.2	48.25 −.04	74.3 −3.6	21.78 +.10	60.9 −2.1	12.96 +.12	53.3 −0.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Draconis.		τ Draconis.		δ Aquilæ.		κ Aquilæ.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 19 12	° ′ +67 27	h m 19 17	° ′ +73 8	h m 19 19	° ′ + 2 53	h m 19 30	° ′ − 7 16
	s	″	s	″	s	″	s	″
Jan. 0.0	28.27 −.08	65.9 −3.5	35.82 −.16	65.4 −3.5	54.79 +.07	42.6 −1.4	55.99 +.07	21.1 −0.9
10.0	28.24 +.03	62.4 3.6	35.73 .00	61.9 3.6	54.88 .11	41.1 1.5	56.08 .11	21.9 0.8
20.0	28.33 .14	58.8 3.5	35.79 +.13	58.3 3.5	55.01 .15	39.6 1.4	56.21 .14	22.8 0.8
29.9	28.52 .24	55.3 3.4	35.99 .27	54.8 3.4	55.17 .18	38.2 1.3	56.37 .17	23.5 0.7
Feb. 8.9	28.81 .33	52.1 3.1	36.32 .40	51.5 3.1	55.37 .21	37.0 1.1	56.56 .20	24.2 0.6
18.9	29.19 +.42	49.2 −2.6	36.78 +.51	48.6 −2.7	55.59 +.23	36.0 −0.9	56.78 +.23	24.6 −0.4
28.9	29.64 .49	46.8 2.1	37.34 .61	46.1 2.2	55.83 .25	35.2 0.6	57.01 .25	24.9 −0.2
Mar. 10.8	30.16 .54	44.9 1.6	37.99 .69	44.2 1.6	56.08 .27	34.8 −0.3	57.27 .27	25.0 0.0
20.8	30.73 .58	43.7 0.9	38.71 .74	42.8 1.0	56.36 .28	34.6 0.0	57.55 .28	24.9 +0.3
30.8	31.32 .60	43.1 −0.3	39.47 .77	42.2 −0.4	56.64 .29	34.8 +0.3	57.83 .29	24.5 0.5
Apr. 9.7	31.93 +.60	43.2 +0.4	40.24 +.77	42.1 +0.3	56.93 +.29	35.3 +0.7	58.13 +.30	23.9 +0.7
19.7	32.52 .58	43.9 1.0	41.01 .75	42.7 0.9	57.23 .29	36.1 1.0	58.43 .30	23.1 0.9
29.7	33.10 .55	45.2 1.6	41.74 .70	43.9 1.5	57.52 .29	37.2 1.2	58.73 .30	22.1 1.1
May 9.7	33.62 .50	47.1 2.1	42.42 .64	45.7 2.0	57.81 .28	38.5 1.4	59.03 .29	21.0 1.2
19.6	34.10 .44	49.5 2.6	43.02 .55	48.0 2.5	58.08 .27	40.0 1.5	59.31 .28	19.8 1.2
29.6	34.50 +.36	52.2 +2.9	43.52 +.45	50.7 +2.9	58.34 +.24	41.6 +1.6	59.58 +.26	18.5 +1.3
June 8.6	34.82 .28	55.3 3.2	43.92 .34	53.7 3.1	58.57 .22	43.3 1.7	59.83 .23	17.3 1.2
18.6	35.06 .19	58.6 3.4	44.21 .22	57.0 3.3	58.77 .19	45.0 1.7	60.05 .20	16.0 1.2
28.5	35.19 +.09	62.0 3.4	44.36 +.09	60.4 3.4	58.94 .15	46.6 1.6	60.24 .17	14.9 1.1
July 8.5	35.23 −.01	65.5 3.4	44.39 −.04	63.8 3.4	59.07 .11	48.2 1.5	60.39 .13	13.8 1.0
18.5	35.17 −.11	68.9 +3.3	44.29 −.17	67.2 +3.3	59.16 +.07	49.6 +1.4	60.49 +.08	12.9 +0.8
28.4	35.02 .20	72.1 3.1	44.06 .29	70.5 3.2	59.20 +.02	50.9 1.2	60.55 +.04	12.2 0.7
Aug. 7.4	34.77 .30	75.2 2.9	43.70 .41	73.6 3.0	59.20 −.02	52.0 1.0	60.57 .00	11.5 0.5
17.4	34.43 .38	77.9 2.6	43.24 .52	76.4 2.7	59.16 .06	53.0 0.8	60.55 −.05	11.1 0.4
27.4	34.01 .45	80.3 2.2	42.67 .61	78.9 2.3	59.08 .10	53.7 0.6	60.48 .09	10.8 0.2
Sept. 6.3	33.53 −.51	82.4 +1.8	42.02 −.69	81.0 +1.9	58.97 −.13	54.3 +0.4	60.38 −.12	10.6 +0.1
16.3	32.99 .56	83.9 1.3	41.29 .75	82.7 1.5	58.83 .15	54.6 +0.2	60.25 .14	10.6 0.0
26.3	32.41 .59	85.0 0.8	40.51 .80	83.9 1.0	58.67 .16	54.7 0.0	60.09 .16	10.7 −0.1
Oct. 6.3	31.82 .60	85.6 +0.3	39.70 .82	84.6 +0.5	58.51 .17	54.7 −0.2	59.93 .16	10.9 0.2
16.2	31.21 .60	85.7 −0.2	38.88 .82	84.8 −0.1	58.34 .16	54.4 0.3	59.77 .16	11.2 0.3
26.2	30.62 −.58	85.2 −0.8	38.06 −.80	84.4 −0.6	58 18 −.15	54.0 −0.5	59.61 −.15	11.5 −0.4
Nov. 5.2	30.05 .54	84.1 1.3	37.28 .75	83.5 1.2	58.04 .13	53.3 0.7	59.47 .13	12.0 0.5
15.1	29.53 .49	82.5 1.8	36.56 .69	82.1 1.7	57.92 .10	52.5 0.9	59.35 .10	12.6 0.6
25.1	29.08 .42	80.4 2.3	35.90 .60	80.1 2.2	57.84 .07	51.5 1.1	59.27 .07	13.2 0.7
Dec. 5.1	28.70 .34	77.9 2.8	35.35 .50	77.6 2.7	57.79 −.03	50.3 1.2	59.22 −.03	13.9 0.7
15.1	28.40 −.24	74.9 −3.1	34.91 −.38	74.7 −3.0	57.78 +.01	49.0 −1.3	59.21 +.01	14.7 −0.8
25.0	28.21 .14	71.6 3.4	34.59 .25	71.5 3.3	57.82 .05	47.6 1.4	59.24 .05	15.5 0.8
35.0	28.12 −.04	68.1 −3.5	34.41 −.11	68.1 −3.5	57.89 +.09	46.2 −1.4	59.31 +.09	16.3 −0.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Aquilæ.		α Aquilæ. (*Altair.*)		ε Draconis.		β Aquilæ.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 19 40	° ′ +10 20	h m 19 45	° ′ + 8 34	h m 19 48	° ′ +69 58	h m 19 49	° ′ + 6 7
	s	″	s	″	s	″	s	″
Jan. 0.0	59.53 +.05	41.6 −1.8	22.71 +.05	38.6 −1.7	28.80 −.20	79.0 −3.3	52.32 +.04	53.3 −1.6
10.0	59.60 .08	39.8 1.8	22.78 .08	36.9 1.7	28.66 −.08	75.6 3.5	52.38 .08	51.8 1.6
20.0	59.70 .12	37.9 1.8	22.88 .12	35.3 1.6	28.64 +.04	72.1 3.5	52.48 .12	50.2 1.5
30.0	59.84 .15	36.2 1.7	23.01 .15	33.6 1.5	28.74 .16	68.6 3.4	52.61 .15	48.7 1.4
Feb. 8.9	60.01 .18	34.6 1.5	23.18 .18	32.2 1.4	28.95 .27	65.2 3.2	52.78 .18	47.4 1.2
18.9	60.21 +.21	33.3 −1.2	23.37 +.21	30.9 −1.1	29.28 +.37	62.1 −2.9	52.97 +.20	46.2 −1.0
28.9	60.43 .23	32.2 0.9	23.59 .23	30.0 0.8	29.70 .47	59.4 2.5	53.18 .23	45.4 0.7
Mar. 10.9	60.67 .25	31.5 0.5	23.84 .25	29.3 0.5	30.21 .54	57.2 2.0	53.42 .25	44.8 0.4
20.8	60.94 .27	31.2 −0.2	24.10 .27	29.0 −0.1	30.79 .60	55.5 1.4	53.68 .27	44.6 −0.1
30.8	61.21 .28	31.2 +0.2	24.37 .28	29.1 +0.3	31.42 .64	54.5 0.7	53.95 .28	44.7 +0.3
Apr. 9.8	61.50 +.29	31.7 +0.6	24.66 +.29	29.6 +0.6	32.08 +.66	54.1 −0.1	54.24 +.29	45.1 +0.6
19.7	61.80 .30	32.5 1.0	24.96 .30	30.4 1.0	32.74 .66	54.3 +0.6	54.53 .30	45.9 1.0
29.7	62.09 .29	33.6 1.3	25.26 .30	31.6 1.3	33.40 .64	55.2 1.2	54.83 .30	47.1 1.3
May 9.7	62.39 .29	35.0 1.6	25.55 .29	33.0 1.6	34.02 .60	56.7 1.7	55.13 .29	48.4 1.5
19.7	62.67 .27	36.7 1.8	25.83 .28	34.7 1.8	34.60 .54	58.7 2.2	55.41 .28	50.0 1.7
29.6	62.93 +.25	38.6 +1.9	26.10 +.26	36.5 +1.9	35.11 +.47	61.2 +2.7	55.68 +.26	51.8 +1.9
June 8.6	63.18 .23	40.6 2.0	26.35 .23	38.5 2.0	35.53 .38	64.0 3.0	55.93 .24	53.6 1.9
18.6	63.39 .20	42.7 2.1	26.57 .20	40.5 2.0	35.87 .28	67.2 3.2	56.16 .21	55.5 1.9
28.6	63.57 .16	44.7 2.0	26.76 .17	42.4 1.9	36.10 .18	70.6 3.4	56.35 .17	57.4 1.8
July 8.5	63.72 .12	46.7 1.9	26.91 .13	44.4 1.9	36.23 +.07	74.1 3.5	56.50 .13	59.2 1.7
18.5	63.82 +.08	48.6 +1.8	27.01 +.09	46.2 +1.8	36.24 −.04	77.6 +3.5	56.62 +.09	60.9 +1.6
28.5	63.87 +.04	50.4 1.7	27.08 +.04	47.9 1.6	36.15 .15	81.0 3.4	56.68 +.05	62.4 1.5
Aug. 7.4	63.89 −.01	52.0 1.5	27.10 .00	49.4 1.4	35.95 .25	84.3 3.2	56.71 .00	63.8 1.3
17.4	63.85 .05	53.3 1.3	27.07 −.04	50.7 1.2	35.64 .35	87.4 3.0	56.69 −.04	65.0 1.1
27.4	63.78 .09	54.5 1.0	27.01 .08	51.8 1.0	35.25 .44	90.2 2.7	56.63 .08	65.9 0.8
Sept. 6.4	63.68 −.12	55.4 +0.8	26.91 −.11	52.6 +0.7	34.76 −.52	92.7 +2.3	56.53 −.11	66.7 +0.6
16.3	63.54 .15	56.0 0.5	26.78 .14	53.2 0.5	34.21 .58	94.8 1.9	56.41 .14	67.2 0.4
26.3	63.39 .16	56.4 +0.3	26.63 .16	53.6 +0.2	33.60 .63	96.5 1.4	56.26 .16	67.5 +0.2
Oct. 6.3	63.22 .17	56.5 0.0	26.46 .17	53.7 0.0	32.95 .66	97.6 0.9	56.10 .16	67.5 −0.1
16.3	63.04 .17	56.4 −0.3	26.29 .17	53.6 −0.2	32.28 .67	98.2 +0.4	55.93 .16	67.4 0.3
26.2	62.88 −.16	56.0 −0.5	26.13 −.16	53.2 −0.5	31.61 −.67	98.4 −0.2	55.77 −.16	67.0 −0.5
Nov. 5.2	62.72 .14	55.3 0.8	25.98 .14	52.6 0.7	30.95 .64	97.9 0.7	55.62 .14	66.4 0.7
15.2	62.59 .12	54.4 1.0	25.84 .12	51.7 1.0	30.32 .60	96.9 1.3	55.48 .12	65.6 0.9
25.1	62.49 .09	53.2 1.3	25.74 .08	50.7 1.2	29.75 .54	95.3 1.8	55.38 .08	64.6 1.1
Dec. 5.1	62.42 .05	51.9 1.5	25.68 .05	49.4 1.4	29.25 .46	93.2 2.3	55.32 .05	63.4 1.3
15.1	62.39 −.01	50.3 −1.6	25.64 −.01	47.9 −1.5	28.83 −.37	90.6 −2.8	55.28 −.01	62.0 −1.4
25.1	62.39 +.03	48.6 1.7	25.65 +.03	46.4 1.6	28.51 .27	87.6 3.1	55.29 +.02	60.5 1.5
35.0	62.44 +.07	46.8 −1.8	25.70 +.06	44.7 −1.6	28.30 −.15	84.4 −3.3	55.33 +.06	59.0 −1.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	τ Aquilæ.		α² Capricorni.		κ Cephei.		α Pavonis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 19 58	° ′ + 6 57	h m 20 11	° ′ −12 53	h m 20 12	° ′ +77 22	h m 20 16	° ′ −57 4
	s	″	s	″	s	″	s	″
Jan. 0.1	43.77 +.03	61.1 −1.6	54.69 +.04	13.3 −0.4	30.03 −.48	52.3 −3.1	53.07 +.02	82.9 +2.1
10.0	43.82 .07	59.5 1.6	54.74 .07	13.7 0.4	29.65 .29	49.1 3.3	53.12 .09	80.7 2.2
20.0	43.91 .10	57.9 1.5	54.83 .11	14.0 0.3	29.44 −.11	45.7 3.4	53.25 .16	78.4 2.3
30.0	44.03 .14	56.4 1.4	54.96 .14	14.3 0.2	29.43 +.08	42.2 3.4	53.44 .22	76.1 2.4
Feb. 9.0	44.19 .17	55.1 1.2	55.11 .17	14.4 −0.1	29.61 .27	38.8 3.3	53.69 .28	73.7 2.3
18.9	44.37 +.20	53.9 −1.0	55.30 +.20	14.5 0.0	29.97 +.45	35.6 −3.1	54.00 +.33	71.4 +2.2
28.9	44.58 .22	53.0 0.7	55.51 .22	14.3 +0.2	30.50 .61	32.7 2.7	54.35 .38	69.2 2.1
Mar. 10.9	44.81 .24	52.5 0.4	55.75 .25	14.1 0.4	31.19 .74	30.2 2.2	54.75 .42	67.2 2.0
20.8	45.06 .26	52.2 −0.1	56.01 .27	13.6 0.6	31.99 .85	28.2 1.7	55.19 .45	65.3 1.8
30.8	45.34 .28	52.3 +0.3	56.28 .28	12.9 0.8	32.90 .94	26.8 1.1	55.66 .48	63.6 1.5
Apr. 9.8	45.62 +.29	52.8 +0.6	56.57 +.30	12.1 +0.9	33.86 +.98	26.1 −0.5	56.16 +.50	62.2 +1.3
19.8	45.91 .30	53.6 1.0	56.88 .31	11.1 1.1	34.86 1.00	25.9 +0.2	56.68 .52	61.0 1.0
29.7	46.21 .30	54.8 1.3	57.19 .31	9.9 1.2	35.86 .98	26.4 0.8	57.20 .53	60.2 0.7
May 9.7	46.51 .29	56.2 1.5	57.50 .31	8.7 1.2	36.82 .93	27.5 1.4	57.73 .52	59.7 +0.4
19.7	46.80 .28	57.8 1.7	57.81 .30	7.5 1.2	37.71 .85	29.2 1.9	58.24 .51	59.5 0.0
29.7	47.07 +.27	59.6 +1.8	58.11 +.29	6.3 +1.2	38.51 +.74	31.4 +2.4	58.74 +.48	59.7 −0.4
June 8.6	47.33 .24	61.5 1.9	58.39 .27	5.0 1.2	39.19 .61	34.0 2.8	59.21 .45	60.2 0.7
18.6	47.56 .21	63.4 1.9	58.65 .24	3.9 1.1	39.73 .47	37.0 3.1	59.63 .40	61.1 1.0
28.6	47.76 .18	65.4 1.9	58.87 .21	2.9 0.9	40.12 .31	40.2 3.3	60.01 .34	62.2 1.3
July 8.5	47.92 .14	67.2 1.8	59.06 .17	2.0 0.8	40.35 +.15	43.6 3.4	60.32 .28	63.7 1.6
18.5	48.04 +.10	69.0 +1.7	59.21 +.13	1.3 +0.6	40.42 −.02	47.1 +3.5	60.56 +.21	65.4 −1.8
28.5	48.11 .05	70.6 1.5	59.31 .08	0.7 0.5	40.31 .19	50.6 3.5	60.73 .13	67.3 2.0
Aug. 7.5	48.15 +.01	72.0 1.4	59.37 +.04	0.4 0.3	40.04 .35	54.0 3.4	60.82 +.05	69.4 2.1
17.4	48.13 −.03	73.4 1.2	59.38 −.01	0.2 +0.1	39.61 .50	57.3 3.2	60.83 −.03	71.4 2.1
27.4	48.08 .07	74.4 0.9	59.35 .05	0.1 0.0	39.03 .65	60.4 2.9	60.77 .10	73.5 2.0
Sept. 6.4	47.99 −.10	75.2 +0.7	59.28 −.09	0.2 −0.1	38.32 −.77	63.2 +2.6	60.63 −.17	75.5 −1.9
16.4	47.87 .13	75.8 0.5	59.18 .12	0.3 0.2	37.48 .88	65.6 2.2	60.43 .23	77.2 1.7
26.3	47.73 .15	76.2 +0.2	59.04 .14	0.6 0.3	36.55 .97	67.7 1.8	60.18 .27	78.8 1.4
Oct. 6.3	47.57 .16	76.3 0.0	58.89 .15	0.9 0.4	35.55 1.03	69.3 1.3	59.89 .30	80.0 1.0
16.3	47.40 .16	76.2 −0.2	58.73 .16	1.3 0.4	34.49 1.07	70.4 0.8	59.58 .31	80.8 0.6
26.2	47.24 −.16	75.8 −0.5	58.58 −.15	1.7 −0.4	33.40 −1.08	71.0 +0.3	59.27 −.31	81.2 −0.2
Nov. 5.2	47.08 .14	75.3 0.7	58.43 .14	2.2 0.4	32.32 1.07	71.0 −0.3	58.96 .29	81.2 +0.2
15.2	46.95 .12	74.5 0.9	58.30 .12	2.6 0.5	31.26 1.03	70.4 0.8	58.69 .25	80.8 0.6
25.2	46.84 .09	73.5 1.1	58.19 .09	3.1 0.5	30.27 .95	69.3 1.4	58.46 .21	80.0 1.0
Dec. 5.1	46.77 .06	72.3 1.3	58.12 .06	3.6 0.5	29.36 .85	67.6 1.9	58.28 .15	78.7 1.4
15.1	46.73 −.02	71.0 −1.4	58.08 −.02	4.0 −0.4	28.57 −.73	65.4 −2.4	58.16 −.09	77.2 +1.7
25.1	46.72 +.01	69.5 1.5	58.08 +.02	4.4 0.4	27.91 .58	62.8 2.8	58.11 −.02	75.3 2.0
35.1	46.76 +.05	68.0 −1.6	58.12 +.05	4.9 −0.4	27.41 −.41	59.8 −3.2	58.12 +.02	73.2 +2.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Cygni.		π Capricorni.		ε Delphini.		Groombridge 3241.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	$20^{h}\ 18^{m}$	$+39^{\circ}\ 53'$	$20^{h}\ 20^{m}$	$-18^{\circ}\ 34'$	$20^{h}\ 27^{m}$	$+10^{\circ}\ 55'$	$20^{h}\ 30^{m}$	$+72^{\circ}\ 9'$
	s	″	s	″	s	″	s	″
Jan. 0.1	14.64 −.05	78.4 −2.8	59.06 +.03	26.1 −0.1	55.31 .00	44.4 −1.7	24.92 −.35	37.6 −3.0
10.0	14.62 .00	75.6 2.9	59.11 .07	26.1 0.0	55.34 +.04	42.8 1.7	24.63 .23	34.5 3.2
20.0	14.65 +.05	72.6 3.0	59.20 .10	26.1 +0.1	55.39 .07	41.1 1.7	24.47 −.10	31.2 3.4
30.0	14.72 .10	69.6 3.0	59.32 .14	26.0 0.2	55.48 .11	39.4 1.6	24.43 +.03	27.7 3.4
Feb. 9.0	14.85 .14	66.8 2.7	59.47 .17	25.8 0.3	55.60 .14	37.9 1.4	24.53 .16	24.3 3.3
18.9	15.01 +.19	64.2 −2.4	59.65 +.20	25.5 +0.4	55.76 +.17	36.6 −1.2	24.76 +.29	21.0 −3.1
28.9	15.22 .23	61.9 2.0	59.87 .22	25.0 0.5	55.94 .20	35.5 0.9	25.11 .41	18.0 2.8
Mar. 10.9	15.46 .26	60.1 1.6	60.10 .25	24.4 0.7	56.15 .22	34.8 0.6	25.57 .51	15.4 2.4
20.9	15.74 .29	58.7 1.1	60.36 .27	23.7 0.8	56.39 .25	34.4 −0.2	26.13 .60	13.3 1.8
30.8	16.05 .32	57.9 −0.5	60.64 .29	22.8 0.9	56.64 .27	34.4 +0.2	26.77 .66	11.8 1.2
Apr. 9.8	16.38 +.33	57.7 0.0	60.94 +.30	21.8 +1.0	56.92 +.28	34.7 +0.6	27.46 +.71	10.8 −0.6
19.8	16.72 .34	58.0 +0.6	61.25 .31	20.7 1.1	57.21 .29	35.5 0.9	28.19 .73	10.5 0.0
29.7	17.07 .35	58.9 1.2	61.57 .32	19.5 1.2	57.51 .30	36.6 1.3	28.92 .73	10.9 +0.7
May 9.7	17.41 .34	60.3 1.7	61.89 .32	18.4 1.2	57.81 .30	38.0 1.6	29.65 .71	11.9 1.3
19.7	17.75 .33	62.2 2.1	62.21 .32	17.2 1.1	58.11 .29	39.7 1.8	30.33 .66	13.4 1.8
29.7	18.07 +.30	64.5 +2.5	62.53 +.30	16.1 +1.1	58.40 +.28	41.6 +2.0	30.97 +.59	15.5 +2.3
June 8.6	18.36 .27	67.1 2.8	62.82 .28	15.0 1.0	58.67 .26	43.6 2.1	31.52 .51	18.0 2.7
18.6	18.61 .23	70.0 3.0	63.09 .25	14.1 0.8	58.92 .23	45.7 2.1	31.99 .41	20.9 3.0
28.6	18.83 .19	73.1 3.1	63.33 .22	13.3 0.7	59.14 .20	47.9 2.1	32.35 .31	24.1 3.3
July 8.6	19.00 .14	76.2 3.1	63.53 .18	12.7 0.5	59.32 .16	50.0 2.1	32.60 .19	27.5 3.5
18.5	19.11 +.09	79.4 +3.1	63.70 +.14	12.3 +0.3	59.47 +.12	52.1 +2.0	32.74 +.07	31.1 +3.6
28.5	19.18 +.04	82.4 3.0	63.81 .09	12.1 +0.2	59.57 .08	54.0 1.8	32.75 −.05	34.6 3.5
Aug. 7.5	19.19 −.02	85.4 2.9	63.89 +.05	12.0 0.0	59.63 +.03	55.8 1.7	32.64 .17	38.2 3.5
17.4	19.15 .07	88.2 2.6	63.91 .00	12.1 −0.2	59.64 −.01	57.3 1.5	32.42 .28	41.6 3.3
27.4	19.06 .11	90.7 2.3	63.89 −.04	12.3 0.3	59.61 .05	58.7 1.2	32.08 .39	44.8 3.1
Sept. 6.4	18.92 −.16	92.9 +2.0	63.82 −.08	12.7 −0.4	59.53 −.09	59.7 +1.0	31.64 −.48	47.8 +2.8
16.4	18.74 .19	94.7 1.7	63.72 .12	13.1 0.5	59.43 .12	60.6 0.7	31.11 .57	50.4 2.4
26.3	18.54 .22	96.2 1.3	63.59 .14	13.6 0.5	59.30 .14	61.2 0.5	30.50 .64	52.6 2.0
Oct. 6.3	18.31 .24	97.2 0.8	63.44 .15	14.1 0.5	59.15 .16	61.5 +0.2	29.83 .67	54.4 1.6
16.3	18.06 .24	97.8 +0.4	63.28 .16	14.6 0.5	58.99 .16	61.6 −0.1	29.12 .72	55.7 1.1
26.2	17.82 −.24	98.0 −0.1	63.12 −.16	15.1 −0.5	58.82 −.16	61.4 −0.3	28.38 −.74	56.5 +0.5
Nov. 5.2	17.58 .23	97.6 0.6	62.96 .14	15.5 0.4	58.66 .15	60.9 0.6	27.64 .73	56.7 −0.1
15.2	17.35 .21	96.7 1.0	62.83 .12	15.9 0.3	58.52 .13	60.3 0.8	26.91 .71	56.4 0.6
25.2	17.16 .18	95.5 1.5	62.72 .10	16.2 0.3	58.40 .11	59.3 1.1	26.22 .66	55.5 1.2
Dec. 5.1	16.99 .15	93.8 1.9	62.64 .07	16.4 0.2	58.30 .08	58.1 1.3	25.58 .60	54.0 1.8
15.1	16.86 −.11	91.6 −2.3	62.59 −.03	16.6 −0.2	58.24 −.05	56.8 −1.4	25.02 −.52	51.9 −2.3
25.1	16.77 .07	89.2 2.6	62.59 +.01	16.8 −0.1	58.21 −.01	55.2 1.6	24.55 .42	49.4 2.7
35.1	16.72 −.02	86.4 −2.9	62.62 +.05	16.9 0.0	58.21 +.02	53.6 −1.7	24.19 −.30	46.5 −3.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Cygni.		μ Aquarii.		12 Year Cat. 1879.		ν Cygni.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	20h 37m	+44° 52′	20h 46m	− 9° 23′	20h 52m	+80° 8′	20h 53m	+40° 44′
	s	″	s	″	s	″	s	″
Jan. 0.1	38.63 −.08	77.1 −2.7	41.00 .00	51.7 −0.6	28.10 −.82	28.8 −2.6	2.13 −.08	40.1 −2.5
10.1	38.57 −.03	74.3 2.9	41.02 +.04	52.2 0.5	27.38 .61	25.9 3.0	2.07 −.04	37.5 2.7
20.0	38.57 +.02	71.3 3.0	41.08 .07	52.7 0.4	26.89 .38	22.8 3.2	2.05 +.01	34.7 2.8
30.0	38.61 .07	68.2 3.0	41.16 .10	53.1 0.3	26.62 −.14	19.4 3.4	2.09 .05	31.8 2.9
Feb. 9.0	38.70 .12	65.2 2.9	41.28 .13	53.3 −0.2	26.60 +.10	16.0 3 4	2.16 .10	29.0 2.7
19.0	38.85 +.17	62.4 −2.6	41.43 +.16	53.5 0.0	26.82 +.34	12.7 −3.2	2.29 +.15	26.3 −2.5
28.9	39.04 .21	59.9 2.3	41.61 .19	53.4 +0.2	27.28 .56	9.6 3 0	2.45 .19	23.9 2.2
Mar. 10.9	39.28 .26	57.8 1.9	41.81 .22	53.1 0.4	27.95 .77	6.8 2.6	2.67 .23	21.9 1.8
20.9	39.55 .29	56.2 1.4	42.04 .24	52.6 0.6	28.82 .94	4.4 2.1	2.92 .27	20.3 1.3
30.8	39.86 .32	55.1 0.8	42.29 .26	51.9 0.8	29.84 1.08	2.6 1.6	3.20 .30	19.2 0.8
Apr. 9.8	40.20 +.35	54.6 −0.2	42.57 +.28	51.0 +1.0	30.97+1.18	1.3 −1.0	3.51 +.32	18.7 −0.2
19.8	40.56 .36	54.7 +0.4	42.86 .30	49 9 1.2	32.19 1.23	0.6 −0.4	3.85 .34	18.7 +0.3
29.8	40.93 .37	55.4 1.0	43.16 .31	48.7 1.3	33.44 1.25	0.5 +0.3	4.20 .35	19.3 0.9
May 9.7	41.30 .37	56.6 1.5	43.47 .31	47.3 1.4	34.68 1.22	1.1 0.9	4.55 .35	20.5 1.4
19.7	41.66 .35	58.4 2.0	43.79 .31	45.8 1.5	35.87 1.15	2.3 1.5	4.90 .35	22.1 1.9
29.7	42.01 +.33	60.6 +2.4	44.09 +.30	44.3 +1.5	36.98+1.05	4.0 +2.0	5.24 +.33	24.2 +2.3
June 8.6	42.33 .30	63.1 2.7	44.39 .28	42.9 1.5	37.97 .91	6.2 2.4	5.56 .30	26.7 2.6
18.6	42.61 .26	66.0 3.0	44.66 .26	41.4 1.4	38.80 .75	8.8 2.8	5.85 .27	29.4 2.9
28.6	42.85 .22	69.1 3.2	44.91 .23	40.1 1.3	39.47 .57	11.8 3.1	6.11 .23	32.4 3.1
July 8.6	43.04 .17	72.3 3.3	45.12 .20	38.9 1.1	39.94 .37	15.1 3.3	6.32 .18	35.5 3.2
18.5	43.19 +.11	75.6 +3.3	45.30 +.15	37.9 +0.9	40.21 +.17	18.5 +3.5	6.48 +.13	38.7 +3.2
28.5	43.27 +.06	78.9 3.2	45.43 .11	37.0 0.8	40.28 −.04	22.0 3.6	6.58 .08	41.9 3.1
Aug. 7.5	43.30 .00	82.0 3.1	45.52 .07	36.3 0.7	40.13 .25	25.6 3.5	6.64 +.03	45.0 3.0
17.5	43.27 −.06	85.1 2.9	45.56 +.02	35.9 0.4	39.79 .45	29.1 3.5	6.64 −.03	48.0 2.8
27.4	43.19 .11	87.9 2.6	45.56 −.02	35.6 +0.2	39.24 .64	32.5 3.3	6.59 .08	50.7 2.6
Sept. 6.4	43.05 −.16	90.3 +2.3	45.52 −.06	35.4 0.0	38.50 −.82	35.7 +3.1	6.48 −.12	53.2 +2.3
16.4	42.88 .20	92.5 2.0	45.44 .09	35.5 −0.1	37.61 .97	38.6 2.8	6.34 .16	55.3 2.0
26.3	42.66 .23	94.3 1.6	45.33 .12	35.7 0.2	36.56 1.11	41.2 2.4	6.16 .19	57.1 1.6
Oct. 6.3	42.42 .25	95.7 1.1	45.20 .14	35.9 0.3	35.39 1.22	43.4 2.0	5.96 .22	58.5 1.2
16.3	42.16 .26	96.6 0.7	45.05 .15	36.3 0.4	34.12 1.30	45.2 1.5	5.73 .23	59.5 0.8
26.3	41.89 −.27	97.0 +0.2	44.90 −.15	36.7 −0.5	32.79−1.35	46.4 +1.0	5.49 −.24	60.0 +0.3
Nov. 5.2	41.63 .26	96.9 −0.3	44.75 .14	37.2 0.6	31.41 1.37	47.1 +0.4	5.25 .23	60.1 −0.2
15.2	41.37 .24	96.4 0.8	44.62 .12	37.8 0.6	30.04 1.36	47.2 −0.2	5.02 .22	59.7 0.7
25.2	41.14 .22	95.3 1.3	44.50 .10	38.4 0.6	28.70 1 30	46.8 0.7	4.81 .20	58.7 1.1
Dec. 5.2	40.93 .19	93.7 1.8	44.41 .08	38.9 0.6	27.43 1.21	45.7 1.3	4.62 .17	57.4 1.6
15.1	40.76 −.15	91.7 −2.2	44.35 −.05	39.5 −0.6	26.27−1.09	44.1 −1.9	4.46 −.14	55.6 −2.0
25.1	40.64 .11	89.4 2.5	44.32 −.01	40.1 0.6	25.25 .93	42.0 2.3	4.34 .10	53.4 2.3
35.1	40.55 −.06	86.7 −2.8	44.33 +.02	40.6 −0.6	24.41 −.74	39.4 −2.7	4.25 −.06	50.9 −2.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	61¹ Cygni.		ζ Cygni.		α Cephei.		1 Pegasi.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 21 1	° ′ +38 12	h m 21 8	° ′ +29 46	h m 21 15	° +62 6	h m 21 16	° ′ +19 19
	s	″	s	″	s	″	s	″
Jan. 0.1	55.82 −.07	33.2 −2.3	13.18 −.06	33.7 −2.2	54.62 −.26	76.7 −2.5	57.92 −.05	61.1 −1.8
10.1	55.76 −.03	30.8 2.5	13.13 −.03	31.5 2.3	54.40 .19	74.0 2.9	57.88 −.02	59.3 1.9
20.0	55.76 +.01	28.2 2.6	13.12 +.01	29.1 2.4	54.25 .11	71.0 3.1	57.88 +.02	57.4 1.9
30.0	55.79 .06	25.5 2.7	13.15 .05	26.7 2.4	54.17 −.03	67.7 3.3	57.92 .05	55.5 1.9
Feb. 9.0	55.87 .10	22.9 2.6	13.22 .09	24.3 2.3	54.18 +.05	64.4 3.3	57.98 .08	53.6 1.8
19.0	55.99 +.14	20.4 −2.4	13.33 +.13	22.1 −2.1	54.27 +.13	61.2 −3.1	58.09 +.12	51.9 −1.6
28.9	56.16 .19	18.1 2.1	13.47 .16	20.1 1.8	54.44 .21	58.2 2.9	58.22 .15	50.4 1.3
Mar. 10.9	56.36 .23	16.3 1.7	13.66 .20	18.5 1.4	54.69 .29	55.4 2.5	58.39 .18	49.3 1.0
20.9	56.61 .26	14.8 1.2	13.87 .23	17.2 1.0	55.02 35	53.1 2.1	58.59 .21	48.5 0.6
30.9	56.89 .29	13.8 0.7	14.12 .26	16.4 −0.5	55.40 .41	51.3 1.5	58.82 .24	48.1 −0.2
Apr. 9.8	57.20 +.32	13.4 −0.2	14.40 +.29	16.1 0.0	55.84 +.46	50.1 −0.9	59.08 +.27	48.1 +0.2
19.8	57.53 .34	13.5 +0.4	14.70 .31	16.3 +0.5	56.32 .49	49.4 −0.3	59.36 .29	48.5 0.7
29.8	57.88 .35	14.2 0.9	15.01 .32	17.0 1.0	56.82 .51	49.4 +0.3	59.66 .30	49.4 1.1
May 9.7	58.23 .36	15.4 1.4	15.34 .33	18.2 1.4	57.34 .51	50.0 0.9	59.97 .31	50.7 1.4
19.7	58.59 35	17.1 1.9	15.66 .32	19.8 1.8	57.85 .50	51.2 1.5	60.28 .31	52.3 1.8
29.7	58.94 +.34	19.2 +2.3	15.98 +.31	21.8 +2.2	58.34 +.48	52.9 +2.0	60.59 +.30	54.2 +2.1
June 8.7	59.26 .32	21.7 2.6	16.29 .30	24.1 2.5	58.81 .44	55.2 2.4	60.89 .29	56.3 2.3
18.6	59.57 .28	24.5 2.9	16.57 .27	26.6 2.7	59.22 .39	57.8 2.8	61.17 .27	58.7 2.4
28.6	59.83 .24	27.5 3.1	16.83 .24	29.4 2.8	59.58 .33	60.8 3.1	61.43 .24	61.2 2.5
July 8.6	60.06 .20	30.6 3.2	17.04 .20	32.2 2.9	59.88 .26	64.1 3.4	61.65 .20	63.7 2.5
18.6	60.24 +.15	33.8 +3.2	17.22 +.15	35.1 +2.9	60.10 +.18	67.6 +3.5	61.84 +.16	66.2 +2.5
28.5	60.37 .10	37.0 3.2	17.35 .11	37.9 2.8	60.24 .10	71.2 3.6	61.98 .12	68.6 2.4
Aug. 7.5	60.45 +.05	40.2 3.1	17.43 .06	40.7 2.7	60.31 +.02	74.8 3.6	62.08 .08	70.9 2.2
17.5	60.47 .00	43.1 2.9	17.47 +.01	43.2 2.5	60.29 −.06	78.3 3.5	62.13 +.03	73.0 2.0
27.4	60.44 −.05	45.9 2.7	17.45 −.04	45.6 2.3	60.19 .13	81.7 3.3	62.14 −.01	75.0 1.8
Sept. 6.4	60.37 −.09	48.5 +2.4	17.40 −.08	47.7 +2.0	60.02 −.21	84.9 +3.1	62.10 −.05	76.6 +1.5
16.4	60.25 .13	50.7 2.0	17.30 .11	49.6 1.7	59.78 .27	87.8 2.8	62.03 .09	78.1 1.3
26.4	60.10 .17	52.6 1.7	17.17 .15	51.1 1.4	59.48 .33	90.4 2.4	61.93 .12	79.2 1.0
Oct. 6.3	59.92 .19	54.1 1.3	17.01 .17	52.3 1.0	59.13 .37	92.7 2.0	61.80 .14	80.1 0.7
16.3	59.72 .21	55.1 0.9	16.83 .18	53.1 0.6	58.74 .40	94.4 1.5	61.65 .15	80.6 0.4
26.3	59.51 −.21	55.8 +0.4	16.64 −.19	53.5 +0.2	58.32 −.42	95.7 +1.0	61.49 −.16	80.8 +0.1
Nov. 5.3	59.30 .21	56.0 0.0	16.45 .19	53.5 −0.1	57.89 .43	96.4 +0.5	61.32 .16	80.7 −0.3
15.2	59.09 .20	55.7 −0.5	16.27 .18	53.1 0.5	57.46 .43	96.6 −0.1	61.17 .15	80.3 0.6
25.2	58.90 .18	55.0 1.0	16.10 .16	52.4 0.9	57.03 .41	96.2 0.7	61.02 .14	79.6 0.9
Dec. 5.2	58.73 .16	53.8 1.4	15.95 .14	51.2 1.3	56.64 .38	95.2 1.2	60.90 .12	78.5 1.2
15.1	58.58 −.13	52.2 −1.8	15.82 −.11	49.7 −1.6	56.27 −.34	93.7 −1.8	60.79 −.09	77.2 −1.4
25.1	58.47 .09	50.2 2.1	15.73 .08	47.8 1.9	55.96 .29	91.7 2.3	60.71 .06	75.7 1.6
35.1	58.40 −.05	48.0 −2.4	15.66 −.04	45.7 −2.2	55.70 −.22	89.2 −2.7	60.67 −.03	74.0 −1.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Aquarii.		β Cephei.		ξ Aquarii.		ε Pegasi.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	$21^{\mathrm{h}}\ 25^{\mathrm{m}}$	$-\ 6^{\circ}\ 3'$	$21^{\mathrm{h}}\ 27^{\mathrm{m}}$	$+70^{\circ}\ 4'$	$21^{\mathrm{h}}\ 31^{\mathrm{m}}$	$-\ 8^{\circ}\ 20'$	$21^{\mathrm{h}}\ 38^{\mathrm{m}}$	$+\ 9^{\circ}\ 22'$
	s	″	s	″	s	″	s	″
Jan. 0.1	44.02 −.03	25.0 −0.7	11.21 −.42	47.8 −2.4	51.72 −.03	58.4 −0.5	45.08 −.05	11.2 −1.3
10.1	44.01 .00	25.7 0.6	10.83 .33	45.1 2.8	51.71 .00	58.9 0.5	45.04 −.02	9.9 1.3
20.1	44.03 +.03	26.3 0.5	10.55 .23	42.2 3.1	51.72 +.03	59.3 0.4	45.04 +.01	8.5 1.4
30.0	44.07 .06	26.7 0.4	10.38 −.12	39.0 3.3	51.76 .06	59.7 0.3	45.06 .04	7.2 1.3
Feb. 9.0	44.15 .09	27.1 0.3	10.32 .00	35.6 3.3	51.83 .09	59 9 −0.1	45.11 .07	5.9 1.2
19.0	44.25 +.12	27.3 −0.1	10.38 +.12	32.3 −3.2	51.93 +.12	60.0 0.0	45.20 +.10	4.8 −1.0
28.9	44.39 .15	27.3 +0.1	10.56 .23	29.2 3.0	52.06 .15	59.8 +0.2	45.31 .13	3.9 0.8
Mar. 10.9	44.56 .18	27.1 0.3	10.84 .34	26.2 2.7	52.23 .18	59.5 0.4	45.46 .16	3.3 0.5
20.9	44.75 .21	26.7 0.6	11.23 .44	23.7 2.3	52.42 .21	58.9 0.7	45.64 .19	2.9 −0.2
30.9	44.98 .24	26.0 0.8	11.71 .52	21.6 1.8	52.64 .23	58.1 0.9	45.85 .22	2.9 +0.2
Apr. 9.8	45.23 +.26	25.1 +1.0	12.27 +.59	20.1 −1.2	52.89 +.26	57.1 +1.1	46.09 +.25	3.3 +0.5
19.8	45.50 .28	24.0 1.2	12.89 .64	19.2 −0.6	53.16 .28	55.9 1.3	46.35 .27	4.0 0.9
29.8	45.79 .30	22.6 1.4	13.54 .66	18.8 0.0	53.45 .30	54.5 1.5	46.64 .29	5.0 1.2
May 9.8	46.09 .31	21.1 1.6	14.22 .67	19.2 +0.6	53.75 .31	53.0 1.6	46.94 .30	6.3 1.5
19.7	46.40 .31	19.5 1.7	14.89 .66	20.1 1.2	54.07 .31	51.3 1.7	47.24 .31	7.9 1.7
29.7	46.72 +.31	17.8 +1.7	15.54 +.63	21.6 +1.8	54.38 +.31	49.7 +1.7	47.55 +.31	9.8 +1.9
June 8.7	47.02 .30	16.1 1.7	16.14 .57	23.6 2.3	54.69 .30	48.0 1.7	47 86 .30	11.8 2.1
18.6	47.31 .28	14.4 1.7	16.69 .50	26.1 2.7	54.99 .28	46.3 1.6	48.14 .28	13.9 2.1
28.6	47.58 .25	12.8 1.6	17.16 .43	29.0 3.0	55.26 .26	44.8 1.5	48.41 .26	16.1 2.2
July 8.6	47.82 .22	11.3 1.4	17.54 .34	32.2 3.3	55.51 .23	43.3 1.3	48.66 .22	18.2 2.1
18.6	48.03 +.19	9.9 +1.3	17.84 +.24	35.6 +3.5	55.72 +.19	42.1 +1.2	48.86 +.19	20.4 +2.0
28.5	48.19 .15	8.8 1.1	18.02 .13	39.2 3.6	55.90 .15	41.0 1.0	49.03 .15	22.3 1.9
Aug. 7.5	48.32 .10	7.8 0.9	18.10 +.03	42.9 3.7	56.03 .11	40.2 0.7	49.15 .10	24.2 1.8
17.5	48.39 .06	7.1 0.6	18.07 −.03	46.5 3.6	56.11 .06	39.5 0 5	49.24 .06	25.9 1.6
27.5	48.43 +.01	6.5 0.4	17.94 .18	50.1 3.5	56.15 +.02	39.1 0.3	49.27 +.02	27.3 1.3
Sept. 6.4	48.42 −.03	6.2 +0.2	17.70 −.28	53.5 +3.3	56.15 −.02	38.9 +0.1	49.27 −.02	28.5 +1.1
16.4	48.37 .06	6.0 +0.1	17.38 .37	56.6 3.0	56.11 .06	38.8 0.0	49.23 .06	29.5 0.9
26.4	48.29 .09	6.0 −0.1	16.97 .45	59.5 2.7	56.03 .09	39.0 −0.2	49.15 .09	30.3 0.6
Oct. 6.3	48.18 .12	6.2 0.2	16.48 .51	62.0 2.3	55.93 .11	39.2 0.3	49.05 .11	30.8 0.4
16.3	48.06 .13	6.5 0.3	15.94 .56	64.0 1.8	55.81 .13	39.6 0.4	48.92 .13	31.1 +0.1
26.3	47.92 −.14	6.9 −0.4	15.36 −.60	65.6 +1.3	55.67 −.14	40.1 −0.5	48.79 −.14	31.1 −0.1
Nov. 5.3	47.78 .14	7.4 0.5	14.74 .62	66.7 0.8	55.53 .14	40.6 0.6	48.64 .14	30.9 0.3
15.2	47.65 .13	8.0 0.6	14.12 .62	67.2 +0.2	55.40 .13	41.2 0.6	48.50 .13	30.5 0.5
25.2	47.52 .11	8 6 0.6	13.50 .61	67.1 −0.4	55.27 .12	41.8 0.6	48.37 .12	29.9 0.7
Dec. 5.2	47.42 .09	9.2 0.7	12.90 .58	66.4 1.0	55.17 .10	42.4 0.6	48.26 .11	29.0 0.9
15.2	47.34 −.07	9.9 −0.7	12.35 −.53	65.1 −1.5	55.08 −.07	43.0 −0.6	48.16 −.09	28.0 −1.1
25.1	47.28 .04	10.6 0.7	11.85 .46	63.3 2.1	55.02 .05	43.6 0.6	48.08 .06	26.9 1.2
35.1	47.25 −.01	11.2 −0.6	11.42 −.38	61.0 −2.6	54.99 −.02	44.2 −0.5	48.03 −.04	25.6 −1.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	11 Cephei.		μ Capricorni.		79 Draconis.		α Aquarii.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 21 40	+70° 47′	h m 21 47	−14° 3′	h m 21 51	+73° 10′	h m 22 0	− 0° 51′
	s	″	s	″	s	″	s	″
Jan. 0.1	15.58 – 45	86.3 −2.2	15.88 −.04	79.7 −0.3	26.42 −.56	64.0 −2.1	6.16 −.06	21.6 −0.9
10.1	15.17 .37	83.9 2.6	15.85 −.02	80.0 0.2	25.90 .46	61.7 2.5	6.11 −.03	22.4 0.8
20.1	14.83 .28	81.0 3.0	15.85 +.01	80.1 −0.1	25.49 .35	58.9 2.9	6.09 .00	23.2 0.8
30.0	14.62 .17	77.9 3.2	15.88 .04	80.1 +0.1	25.20 .23	55.9 3.2	6.10 +.02	24.0 0.7
Feb. 9.0	14.52 −.04	74.6 3.3	15.94 .07	79.9 0.3	25.03 −.09	52.6 3.3	6.14 .05	24.6 0 5
19.0	14.54 +.08	71.3 −3.3	16.03 +.10	79.6 +0.4	25.01 +.05	49.3 −3.3	6.21 +.08	25.0 −0.3
Mar. 1.0	14.68 .20	68.1 3.1	16.15 .14	79.1 0.6	25.12 .18	46.1 3.1	6.31 .11	25.2 −0.1
10.9	14.94 .32	65.1 2.8	16.30 .17	78.3 0.8	25.38 .32	43.1 2.9	6.44 .15	25.3 +0.1
20.9	15.31 .42	62.5 2.4	16.48 .20	77.4 1.0	25.76 .44	40.3 2.5	6.60 .18	25.1 0.4
30.9	15.78 .51	60.3 1.9	16.70 .23	76.3 1.2	26.25 .55	38.0 2.1	6.80 .21	24.6 0.6
Apr. 9.9	16.34 +.59	58.6 −1.4	16.94 +.26	75.0 +1.4	26.85 +.64	36.2 −1.5	7.02 +.24	23.8 +0.9
19.8	16.96 .64	57.5 0.8	17.21 .28	73.6 1.5	27.53 .71	34.9 1.0	7.27 .26	22.8 1.1
29.8	17.63 .68	57.1 −0.2	17.50 .30	72.0 1.6	28.27 .75	34.3 −0.4	7.55 .28	21.5 1.4
May 9.8	18.32 .70	57.2 +0.4	17.81 .31	70.4 1.7	29.04 .78	34.2 +0.3	7.84 .30	20.0 1.6
19.7	19.02 .69	57.9 1.0	18.12 .32	68.7 1.7	29.82 .77	34.8 0.9	8.15 .31	18.3 1.7
29.7	19.70 +.66	59.3 +1.6	18.45 +.32	67.0 +1.7	30.59 +.75	36.0 +1.4	8.46 +.31	16.5 +1.8
June 8.7	20.34 .61	61.2 2.1	18.77 .31	65.4 1.6	31.32 .70	37.7 1.9	8.77 .30	14.6 1.9
18.7	20.92 .55	63.5 2.6	19.08 .30	63.8 1.5	31.99 .63	39.9 2.4	9.07 .29	12.7 1.9
28.6	21.44 .47	66.3 2.9	19.37 .28	62.4 1.3	32.58 .54	42.6 2.8	9.36 .27	10.8 1.9
July 8.6	21.86 .38	69.4 3.2	19.63 .25	61.2 1.1	33.09 .45	45.6 3.2	9.61 .24	9.0 1.8
18.6	22.19 +.28	72.8 +3.5	19.86 +.21	60.2 +0.9	33.48 +.34	48.9 +3.4	9.84 +.21	7.3 +1.6
28.6	22.42 .17	76.4 3.6	20.06 .17	59.4 0.7	33.76 .22	52.4 3.6	10.03 .17	5.8 1.4
Aug. 7.5	22.54 +.06	80.0 3.7	20.21 .13	58.8 0.4	33.92 +.10	56.1 3.7	10.19 .13	4.4 1.2
17.5	22.55 −.05	83.7 3.6	20.31 .08	58.5 +0.2	33.96 −.02	59.8 3.7	10.29 .09	3.3 1.0
27.5	22.45 . .15	87.3 3.5	20.37 +.04	58.4 0.0	33.87 .14	63.4 3.6	10.36 +.04	2.4 0.8
Sept. 6.4	22.25 −.25	90.8 +3.4	20.38 −.01	58.5 −0.2	33.67 −.26	67.0 +3.5	10.38 .00	1.7 +0.6
16.4	21.95 .35	94.1 3.1	20.36 .05	58.7 0.3	33.36 .37	70 4 3.3	10.36 −.04	1.2 0.4
26.4	21.55 .43	97.1 2.8	20.29 .08	59.1 0.5	32.94 .46	73.5 3.0	10.31 .07	0.9 +0.2
Oct. 6.4	21.08 .50	99.8 2.5	20.20 .10	59.7 0.6	32.43 .55	76.3 2.6	10.23 .09	0.8 0.0
16.3	20.55 .56	102.0 2.0	20.09 .12	60.3 0.6	31.84 .62	78.7 2.2	10.12 .11	0.9 −0.2
26.3	19.96 −.60	103.8 +1.5	19.96 −.13	60.9 −0.6	31.18 −.68	80.7 +1.7	10.00 −.12	1.2 −0.3
Nov. 5.3	19.34 .63	105.0 1.0	19.82 .14	61.6 0.6	30.48 .71	82.2 1.2	9.87 .13	1.6 0.4
15.3	18.70 .64	105.7 +0.4	19.68 .13	62.2 0.6	29.76 .73	83.1 +0.6	9.74 .13	2.1 0.5
25.2	18.06 .63	105.8 −0.2	19.56 .12	62.8 0.6	29.02 .73	83.4 0.0	9.62 .12	2.7 0.6
Dec. 5.2	17.44 .61	105.4 0.8	19.45 .10	63.3 0.5	28.29 .71	83.1 −0.6	9.50 .11	3.4 0.7
15.2	16.85 −.56	104.3 −1.4	19 35 −.08	63.8 −0.4	27.60 −.67	82.3 −1.2	9.41 −.09	4.2 −0.8
25.1	16.31 .50	102.7 1.9	19.28 .06	64.2 0.3	26.96 .60	80.8 1.7	9.33 .07	5.0 0.8
35.1	15.85 −.42	100 5 −2.4	19.24 – 03	64.5 −0.2	26.39 −.58	78.8 −2.3	9.27 −.04	5.8 −0.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α* Gruis.		*θ* Aquarii.		*π* Aquarii.		*η* Aquarii.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	$22^{h}\ 1^{m}$	$-47° 29'$	$22^{h}\ 10^{m}$	$-8° 19'$	$22^{h}\ 19^{m}$	$+0° 48'$	$22^{h}\ 29^{m}$	$-0° 40'$
	s	″	s	″	s	″	s	″
Jan. 0.1	15.30 -.10	53.7 +1.2	59.87 -.06	60.3 -0.5	37.78 -.07	62.9 -0.9	40.48 -.08	71.0 -0.8
10.1	15.22 .06	52.3 1.5	59.82 .04	60.8 0.4	37.73 .05	62.0 0.8	40.42 .05	71.8 0.8
20.1	15.18 -.02	50.6 1.8	59.80 -.01	61.2 0.3	37.69 -.02	61.2 0.8	40.38 -.03	72.5 0.7
30.0	15.19 +.03	48.7 2.0	59.80 +.02	61.5 0.2	37.68 +.01	60.4 0.7	40.36 .00	73.2 0.6
Feb. 9.0	15.24 .07	46.6 2.2	59.83 .05	61.6 -0.1	37.70 .03	59.7 0.6	40.37 +.02	73.7 0.5
19.0	15.34 +.12	44.2 +2.4	59.89 +.08	61.6 +0.1	37.75 +.06	59.2 -0.4	40.41 +.05	74.2 -0.3
Mar. 1.0	15.48 .17	41.8 2.5	59.98 .11	61.4 0.3	37.83 .09	58.9 -0.2	40.48 .08	74.4 -0.1
10.9	15.67 .22	39.2 2.5	60.11 .14	61.0 0.5	37.94 .13	58.8 0.0	40.58 .12	74.4 +0.1
20.9	15.91 .26	36.7 2.5	60.26 .17	60.3 0.8	38.08 .16	59.0 +0.3	40.71 .15	74.1 0.4
30.9	16.18 .29	34.2 2.5	60.45 .20	59.4 1.0	38.26 .19	59.4 0.6	40.88 .18	73.6 0.6
Apr. 9.9	16.49 +.33	31.7 +2.4	60.67 +.23	58.3 +1.2	38.47 +.22	60.1 +0.9	41.08 +.22	72.8 +0.9
19.8	16.84 .37	29.4 2.2	60.92 .26	57.0 1.4	38.71 .25	61.1 1.1	41.32 .25	71.8 1.2
29.8	17.22 .40	27.3 2.0	61.19 .28	55.5 1.6	38.97 .28	62.3 1.4	41.58 .27	70.5 1.4
May 9.8	17.63 .42	25.4 1.8	61.49 .30	53.8 1.7	39.26 .30	63.8 1.6	41.86 .29	69.0 1.6
19.7	18.06 .43	23.7 1.5	61.80 .31	52.1 1.8	39.56 .31	65.5 1.8	42.16 .31	67.2 1.8
29.7	18.49 +.43	22.4 +1.2	62.11 +.32	50.2 +1.8	39.87 +.31	67.3 +1.9	42.47 +.31	65.4 +1.9
June 8.7	18.92 .43	21.4 0.8	62.43 .31	48.4 1.8	40.19 .31	69.3 2.0	42.79 .31	63.5 2.0
18.7	19.35 .41	20.8 0.4	62.74 .30	46.6 1.7	40.49 .30	71.3 2.0	43.10 .30	61.5 2.0
28.6	19.75 .38	20.6 +0.1	63.04 .28	44.9 1.6	40.79 .28	73.2 1.9	43.39 .29	59.5 1.9
July 8.6	20.11 .35	20.7 -0.3	63.31 .26	43.4 1.5	41.06 .26	75.1 1.9	43.67 .26	57.7 1.8
18.6	20.44 +.30	21.2 -0.7	63.55 +.22	42.0 +1.3	41.30 +.22	76.9 +1.7	43.92 +.23	55.9 +1.7
28.6	20.72 .25	22.1 1.1	63.75 .18	40.8 1.1	41.50 .19	78.6 1.6	44.13 .20	54.3 1.5
Aug. 7.5	20.93 .19	23.4 1.4	63.92 .14	39.8 0.8	41.67 .15	80.1 1.4	44.31 .16	52.9 1.3
17.5	21.09 .13	24.9 1.6	64.04 .10	39.1 0.6	41.80 .10	81.3 1.2	44.45 .11	51.7 1.1
27.5	21.19 +.06	26.6 1.8	64.12 .06	38.6 0.4	41.88 .06	82.4 0.9	44.54 .07	50.7 0.9
Sept. 6.4	21.22 .00	28.5 -1.9	64.16 +.02	38.3 +0.2	41.92 +.02	83.2 +0.7	44.59 +.03	49.9 +0.6
16.4	21.19 -.06	30.4 1.9	64.15 -.02	38.3 0.0	41.92 -.02	83.8 0.5	44.60 -.01	49.4 0.4
26.4	21.10 .11	32.4 1.9	64.11 .06	38.4 -0.2	41.88 .05	84.2 0.3	44.58 .04	49.1 +0.2
Oct. 6.4	20.97 .15	34.2 1.8	64.04 .09	38.7 0.3	41.82 .08	84.4 +0.1	44.52 .07	49.0 0.0
16.3	20.80 .19	35.9 1.6	63.94 .11	39.1 0.5	41.73 .10	84.4 -0.1	44.43 .09	49.1 -0.2
26.3	20.59 -.21	37.3 -1.3	63.83 -.12	39.6 -0.6	41.62 -.12	84.2 -0.3	44.33 -.11	49.3 -0.3
Nov. 5.3	20.38 .22	38.5 1.0	63.70 .13	40.2 0.6	41.49 .12	83.8 0.4	44.22 .12	49.7 0.4
15.3	20.16 .22	39.3 0.6	63.57 .13	40.8 0.6	41.37 .12	83.4 0.5	44.10 .12	50.2 0.5
25.2	19.94 .21	39.6 -0.2	63.45 .12	41.5 0.6	41.25 .12	82.8 0.6	43.98 .12	50.8 0.6
Dec. 5.2	19.74 .18	39.6 +0.2	63.34 .11	42.1 0.6	41.13 .11	82.1 0.7	43.86 .11	51.4 0.7
15.2	19.57 -.15	39.2 +0.6	63.24 -.09	42.7 -0.6	41.03 -.09	81.4 -0.8	43.76 -.10	52.2 -0.7
25.1	19.44 .12	38.4 1.0	63.16 .07	43.3 0.5	40.94 .08	80.6 0.8	43.67 .08	52.9 0.8
35.1	19.33 -.09	37.2 +1.3	63.10 -.05	43.8 -0.5	40.88 -.06	79.7 -0.9	43.60 -.06	53.7 -0.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	226 Cephei (B.)		ζ Pegasi.		ι Cephei.		λ Aquarii.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 22 30	° ′ +75 39	h m 22 35	° ′ +10 15	h m 22 45	° ′ +65 36	h m 22 46	° ′ − 8 9
	s	″	s	″	s	″	s	″
Jan. 0.2	17.47 −.74	44.9 −1.5	56.88 −.09	22.0 −1.1	43.65 −.41	88.4 −1.4	50.88 −.08	63.2 −0.5
10.1	16.76 .65	43.1 2.1	56.80 .06	20.8 1.2	43.26 .37	86.6 2.0	50.81 .06	63.7 0.4
20.1	16.16 .54	40.8 2.5	56.75 .04	19.6 1.2	42.92 .31	84.4 2.4	50.75 .04	64.0 0.3
30.1	15.67 .41	38.1 2.9	56.72 −.02	18.4 1.2	42.65 .24	81.8 2.7	50.73 −.02	64.3 −0.2
Feb. 9.1	15.33 .27	35.1 3.1	56.71 +.01	17.3 1.1	42.45 .16	78.9 3.0	50.72 +.01	64.4 0.0
19.0	15.14 −.11	31.9 −3.2	56.74 +.04	16.3 −1.0	42.33 −.07	75.9 −3.1	50.75 +.04	64.3 +0.2
Mar. 1.0	15.11 +.06	28.6 3.2	56.80 .07	15.4 0.8	42.31 +.03	72.8 3.1	50.80 .07	64.0 0.4
11.0	15.25 .22	25.5 3.1	56.89 .11	14.7 0.5	42.39 .12	69.8 2.9	50.89 .10	63.6 0.6
20.9	15.55 .38	22.5 2.8	57.02 .14	14.4 −0.2	42.56 .22	66.9 2.7	51.01 .14	62.8 0.8
30.9	16.00 .52	19.9 2.4	57.18 .18	14.3 +0.1	42.82 .31	64.4 2.3	51.16 .17	61.9 1.1
Apr. 9.9	16.59 +.64	17.7 −2.0	57.38 +.21	14.5 +0.4	43.17 +.38	62.3 −1.9	51.35 +.20	60.7 +1.3
19.9	17.29 .75	15.9 1.5	57.61 .24	15.1 0.8	43.60 .46	60.7 1.4	51.57 .24	59.3 1.5
29.8	18.09 .83	14.8 0.9	57.87 .27	16.1 1.1	44.09 .51	59.6 0.8	51.83 .27	57.7 1.7
May 9.8	18.94 .88	14.2 −0.3	58.15 .29	17.3 1.4	44.63 .55	59.1 −0.2	52.11 .29	56.0 1.2
19.8	19.84 .90	14.2 +0.3	58.45 .31	18.8 1.6	45.20 .58	59.2 +0.4	52.41 .31	54.1 1.9
29.8	20.74 +.89	14.8 +0.9	58.76 +.31	20.6 +1.9	45.78 +.58	59.8 +0.9	52.72 +.32	52.2 +1.9
June 8.7	21.63 .86	16.1 1.5	59.08 .31	22.5 2.0	46.37 .57	61.1 1.5	53.04 .32	50.3 1.9
18.7	22.47 .81	17.8 2.0	59.39 .30	24.6 2.1	46.93 .55	62.8 2.0	53.35 .31	48.4 1.9
28.7	23.24 .73	20.1 2.5	59.68 .29	26.8 2.2	47.46 .50	65.1 2.4	53.66 .30	46.6 1.8
July 8.6	23.92 .63	22.8 2.9	59.96 .26	29.0 2.2	47.94 .45	67.7 2.8	53.95 .28	44.9 1.6
18.6	24.49 +.52	25.8 +3.2	60.21 +.23	31.2 +2.1	48.36 +.38	70.7 +3.1	54.21 +.25	43.4 +1.4
28.6	24.95 .39	29.1 3.4	60.43 .20	33.3 2.0	48.71 .31	74.0 3.4	54.45 .21	42.0 1.2
Aug. 7.6	25.27 .26	32.7 3.6	60.61 .16	35.3 1.9	48.98 .23	77.5 3.6	54.64 .18	41.0 0.9
17.5	25.46 +.12	36.4 3.7	60.74 .11	37.1 1.7	49.17 .15	81.1 3.6	54.80 .14	40.2 0.7
27.5	25.52 −.01	40.1 3.7	60.84 .07	38.7 1.5	49.27 +.06	84.8 3.7	54.91 .09	39.6 0.5
Sept. 6.5	25.43 −.16	43.9 +3.7	60.89 +.03	40.1 +1.3	49.29 −.02	88.4 +3.6	54.98 +.05	39.2 +0.2
16.5	25.22 .28	47.5 3.6	60.90 −.01	41.3 1.0	49.23 .10	92.0 3.4	55.01 +.01	39.1 0.0
26.4	24.87 .40	51.0 3.4	60.88 .04	42.2 0.8	49.08 .18	95.3 3.2	55.00 −.03	39.2 −0.2
Oct. 6.4	24.41 .51	54.2 3.1	60.82 .07	42.9 0.6	48.87 .25	98.5 3.0	54.96 .06	39.5 0.4
16.4	23.84 .61	57.1 2.7	60.74 .09	43.3 0.3	48.59 .31	101.3 2.6	54.89 .08	40.0 0.5
26.3	23.18 −.70	59.6 +2.3	60.64 −.11	43.6 +0.1	48.25 −.36	103.7 +2.2	54.80 −.10	40.5 −0.6
Nov. 5.3	22.44 .77	61.6 1.8	60.52 .12	43.6 −0.1	47.87 .40	105.7 1.7	54.69 .11	41.1 0.6
15.3	21.64 .81	63.2 1.2	60.40 .12	43.3 0.3	47.45 .43	107.1 1.2	54.58 .12	41.8 0.7
25.3	20.81 .84	64.1 0.7	60.27 .12	42.9 0.5	47.00 .45	108.1 0.6	54.46 .12	42.5 0.7
Dec. 5.2	19.96 .85	64.5 +0.1	60.15 .12	42.3 0.7	46.55 .46	108.5 +0.1	54.34 −.11	43.2 0.7
15.2	19.11 −.83	64.3 −0.5	60.04 −.11	41.5 −0.9	46.09 −.45	108.2 −0.5	54.24 −.10	43.8 −0.6
25.2	18.30 .78	63.4 1.1	59.94 .10	40.6 1.0	45.65 .43	107.4 1.1	54.14 .09	44.4 0.6
35.2	17.55 −.71	62.0 −1.7	59.86 −.09	39.5 −1.1	45.23 −.39	106.3 −1.6	54.06 −.07	44.9 −0.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Piscis Australis. (*Fomalhaut.*)		α Pegasi. (*Markab.*)		ο Cephei.		θ Piscium.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	$22^{h}\ 51^{m}$	$-30^{\circ}\ 12'$	$22^{h}\ 59^{m}$	$+14^{\circ}\ 36'$	$23^{h}\ 14^{m}$	$+67^{\circ}\ 30'$	$23^{h}\ 22^{m}$	$+\ 5^{\circ}\ 46'$
	s	″	s	″	s	″	s	″
Jan. 0.2	32.44 −.10	34.9 +0.2	15.33 −.10	45.5 −1.1	4.71 −.47	45.9 −1.0	21.83 −.10	22.9 −0.9
10.1	32.35 .08	34.5 0.5	15.23 .08	44.3 1.2	4.25 .44	44.5 1.6	21.73 .09	22.0 0.9
20.1	32.29 .05	33.9 0.8	15.16 .06	43.1 1.3	3.84 .38	42.7 2.1	21.65 .07	21.1 0.9
30.1	32.25 −.02	32.9 1.0	15.11 .04	41.8 1.3	3.49 .31	40.4 2.5	21.59 .05	20.3 0.8
Feb. 9.1	32.24 +.01	31.8 1.3	15.08 −.01	40.5 1.3	3.21 .23	37.7 2.8	21.55 −.03	19.5 0.7
19.0	32.26 +.04	30.4 +1.5	15.08 +.02	39.2 −1.2	3.02 −.14	34.8 −3.0	21.53 .00	18.8 −0.6
Mar. 1.0	32.32 .07	28.8 1.7	15.11 .05	38.2 1.0	2.92 −.04	31.7 3.0	21.54 +.03	18.3 0.4
11.0	32.41 .11	26.9 1.9	15.18 .08	37.3 0.8	2.93 +.06	28.7 3.0	21.59 .06	18.0 −0.2
21.0	32.55 .15	25.0 2.0	15.28 .12	36.7 0.5	3.04 .17	25.8 2.8	21.67 .10	17.9 +0.1
30.9	32.72 .19	22.9 2.1	15.42 .16	36.3 −0.2	3.26 .27	23.1 2.5	21.79 .14	18.0 0.3
Apr. 9.9	32.92 +.22	20.7 +2.2	15.60 +.20	36.3 +0.2	3.58 +.36	20.8 -2.1	21.94 +.18	18.5 +0.6
19.9	33.17 .26	18.4 2.3	15.81 .23	36.7 0.5	3.98 .44	18.9 1.7	22.14 .21	19.2 0.9
29.8	33.44 .29	16.2 2.2	16.06 .26	37.4 0.9	4.47 .52	17.4 1.1	22.36 .24	20.3 1.2
May 9.8	33.75 .32	14.0 2.2	16.34 .29	38.4 1.2	5.01 .57	16.6 −0.6	22.62 .27	21.6 1.4
19.8	34.08 .34	11.8 2.1	16.63 .31	39.8 1.5	5.61 .61	16.3 0.0	22.90 .29	23.2 1.7
29.8	34.43 +.35	9.8 +1.9	16.95 +.32	41.4 +1.8	6.23 +.63	16.6 +0.6	23.21 +.31	24.9 +1.9
June 8.7	34.78 .36	8.0 1.7	17.26 .32	43.3 2.0	6.86 .63	17.5 1.1	23.52 .31	26.9 2.0
18.7	35.14 .35	6.5 1.4	17.58 .31	45.4 2.1	7.48 .61	18.8 1.7	23.83 .31	28.9 2.1
28.7	35.49 .34	5.2 1.1	17.89 .30	47.6 2.2	8.08 .57	20.8 2.1	24.15 .30	31.0 2.1
July 8.6	35.82 .32	4.3 0.8	18.18 .28	49.9 2.3	8.63 .53	23.1 2.6	24.44 .29	33.1 2.1
18.6	36.12 +.29	3.6 +0.4	18.45 +.25	52.2 +2.3	9.13 +.46	25.9 +2.9	24.72 +.26	35.1 +2.0
28.6	36.39 .25	3.4 +0.1	18.68 .22	54.4 2.2	9.56 .39	29.0 3.2	24.97 .23	37.1 1.9
Aug. 7.6	36.62 .21	3.5 −0.2	18.88 .18	56.6 2.1	9.91 .31	32.3 3.5	25.18 .20	38.9 1.7
17.5	36.80 .16	3.8 0.5	19.04 .14	58.7 2.0	10.18 .23	35.9 3.6	25.36 .16	40.5 1.5
27.5	36.93 .11	4.5 0.8	19.15 .10	60.5 1.8	10.37 .14	39.5 3.7	25.51 .12	41.9 1.3
Sept. 6.5	37.02 +.06	5.5 −1.1	19.23 +.05	62.2 +1.6	10.46 +.05	43.2 +3.7	25.61 +.08	43.1 +1.1
16.5	37.06 +.01	6.7 1.2	19.26 +.01	63.7 1.3	10.47 −.04	46.9 3.5	25.67 .04	44.1 0.9
26.4	37.05 −.03	8.0 1.4	19.26 −.02	64.9 1.1	10.39 .12	50.4 3.4	25.69 +.01	44.8 0.6
Oct. 6.4	37.00 .06	9.4 1.4	19.22 .05	65.9 0.9	10.23 .20	53.7 3.2	25.68 −.02	45.3 0.4
16.4	36.92 .10	10.8 1.4	19.16 .08	66.6 0.6	10.00 .27	56.8 2.9	25.64 .05	45.6 +0.2
26.3	36.81 −.12	12.2 −1.3	19.07 −.10	67.1 +0.4	9.70 −.33	59.6 +2.5	25.58 −.07	45.7 0.0
Nov. 5.3	36.68 .13	13.4 1.2	18.96 .11	67.3 +0.1	9.33 .39	61.9 2.1	25.49 .09	45.6 −0.2
15.3	36.54 .14	14.5 1.0	18.85 .12	67.3 −0.1	8.92 .43	63.8 1.6	25.39 .10	45.3 0.3
25.3	36.40 .14	15.4 0.8	18.73 .12	67.0 0.4	8.47 .46	65.2 1.1	25.29 .11	44.9 0.5
Dec. 5.2	36.25 .14	16.1 0.5	18.60 .12	66.5 0.6	7.99 .48	66.0 +0.5	25.18 .11	44.4 0.6
15.2	36.12 −.13	16.4 −0.2	18.48 −.11	65.8 −0.8	7.50 −.49	66.2 −0.1	25.06 −.11	43.7 −0.7
25.2	36.00 .11	16.5 0.0	18.37 .10	64.9 1.0	7.01 .48	65.8 0.7	24.96 .10	43.0 0.8
35.2	35.90 −.09	16.4 +0.3	18.28 −.09	63.9 −1.1	6.54 −.46	64.8 −1.3	24.86 −.09	42.1 −0.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ι Piscium.		γ Cephei.		Groombridge 4163.		ω Piscium.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 23 34	° ′ + 5 1	h m 23 34	° ′ +77 0	h m 23 49	° ′ +73 47	h m 23 53	° ′ + 6 15
	s	″	s	″	s	″	s	″
Jan. 0.2	16.16 −.10	42.1 −0.8	47.73 −.89	78.2 −0.6	27.41 −.72	65.5 −0.4	38.49 −.11	9.5 −0.7
10.2	16.07 .09	41.3 0.8	46.85 .85	77.3 1.2	26.72 .68	64.7 1.1	38.38 .10	8.7 0.8
20.2	15.98 .08	40.4 0.8	46.03 .77	75.8 1.7	26.06 .62	63.4 1.6	38.29 .09	7.9 0.8
30.1	15.91 .06	39.6 0.8	45.31 .67	73.8 2.2	25.47 .55	61.5 2.1	38.20 .07	7.1 0.8
Feb. 9.1	15.86 .04	38.9 0.7	44.70 .53	71.3 2.6	24.97 .45	59.2 2.5	38.14 .05	6.4 0.7
19.1	15.83 −.01	38.3 −0.6	44.24 −.38	68.5 −2.9	24.57 −.33	56.5 −2.8	38.09 −.03	5.7 −0.6
Mar. 1.1	15.84 +.02	37.8 0.4	43.94 .21	65.5 3.1	24.30 .20	53.5 3.0	38.08 .00	5.2 0.4
11.0	15.87 .05	37.5 −0.2	43.82 −.03	62.4 3.1	24.17 −.07	50.5 3.1	38.09 +.03	4.9 −0.2
21.0	15.94 .09	37.5 +0.1	43.88 +.15	59.3 3.0	24.18 +.08	47.4 3.0	38.14 .07	4.8 0.0
30.9	16.05 .13	37.7 0.3	44.13 .33	56.4 2.8	24.35 .23	44.5 2.8	38.22 .11	4.9 +0.3
Apr. 9.9	16.19 +.16	38.2 +0.6	44.55 +.50	53.7 −2.5	24.65 +.37	41.9 −2.5	38 35 +.15	5.3 +0.6
19.9	16.38 .20	38.9 0.9	45.13 .65	51.4 2.1	25.09 .50	39.5 2.1	38.52 .19	6.1 0.8
29.9	16.59 .23	40.0 1.2	45.84 .77	49.5 1.6	25.65 .61	37.6 1.7	38.72 .22	7.0 1.1
May 9.9	16.85 .26	41.3 1.4	46.67 .87	48.2 1.1	26.31 .70	36.2 1.2	38.96 .25	8.3 1.4
19.8	17.12 .29	42.9 1.7	47.59 .95	47.4 −0.5	27.05 .77	35.3 −0.6	39.23 .28	9.8 1.6
29.8	17.42 +.31	44.6 +1.8	48.57 +.99	47.2 +0.1	27.85 +.82	35.0 0.0	39.52 +.30	11.5 +1.8
June 8.8	17.74 .31	46.5 2.0	49.57 1.00	47.6 0.7	28.67 .83	35.3 +0.5	39.83 .31	13.4 1.9
18.7	18.05 .31	48.5 2.1	50.57 .98	48.5 1.2	29.51 .83	36.1 1.1	40.15 .32	15.4 2.0
28.7	18.37 .31	50.6 2.1	51.54 .94	50.0 1.7	30.33 .80	37.5 1.6	40.46 .31	17.4 2.1
July 8.7	18.67 .29	52.7 2.0	52.45 .87	52.0 2.2	31.11 .75	39.4 2.1	40.77 .30	19.5 2.1
18.7	18.95 +.27	54.7 +2.0	53.28 +.78	54.5 +2.7	31.83 +.69	41.7 +2.5	41.06 +.28	21.6 +2.0
28.6	19.21 .24	56.6 1.9	54.01 .68	57.4 3.0	32.48 .60	44.5 2.9	41.33 .25	23.5 1.9
Aug. 7.6	19.44 .21	58.4 1.7	54.63 .55	60.5 3.3	33.04 .51	47.6 3.2	41.57 .22	25.4 1.7
17.6	19.63 .17	60.0 1.5	55.12 .42	64.0 3.5	33.50 .41	50.9 3.5	41.78 .19	27.0 1.5
27.6	19.78 .13	61.4 1.3	55.47 .28	67.6 3.7	33.85 .30	54.5 3.6	41.95 .15	28.5 1.3
Sept. 6.5	19.90 +.09	62.5 +1.0	55.68 +.14	71.4 +3.8	34.09 +.18	58.2 +3.7	42.08 +.11	29.8 +1.1
16.5	19.97 .05	63.4 0.8	55.75 .00	75.2 3.8	34.22 +.07	61.9 3.8	42.17 .07	30.7 0.9
26.5	20.01 +.02	64.1 0.6	55.67 −.15	79.0 3.7	34.23 −.05	65.7 3.7	42.23 .04	31.5 0.7
Oct. 6.4	20.01 −.01	64.6 0.3	55.46 .29	82.6 3.5	34.12 .16	69.3 3.5	42.25 +.01	32.1 0.5
16.4	19.98 .04	64.8 +0.1	55.10 .42	86.0 3.3	33.91 .27	72.8 3.3	42.24 −.02	32.4 +0.2
26.4	19.93 −.06	64.9 −0.1	54.62 −.54	89.2 +3.0	33.59 −.37	76.0 +3.0	42.20 −.05	32.6 0.0
Nov. 5.4	19.85 .08	64.7 0.2	54.02 .65	92.0 2.6	33.17 .46	78.8 2.6	42 14 .07	32.5 −0.1
15.3	19.76 .09	64.4 0.4	53.32 .74	94.4 2.1	32.67 .54	81.3 2.2	42.07 .08	32.3 0.3
25.3	19.66 .10	64.0 0.5	52.54 .82	96.3 1.6	32.09 .61	83.3 1.7	41.98 .09	31.9 0.4
Dec. 5.3	19.56 .11	63.5 0.6	51.68 .87	97.7 1.0	31.45 .66	84.7 1.2	41.88 .10	31.4 0.5
15.3	19.45 −.11	62.8 −0.7	50.79 −.90	98.4 +0.4	30.77 −.69	85.6 +0.6	41.77 −.11	30.8 −0.6
25.2	19.35 .10	62.1 0.8	49.88 .91	98.5 −0.2	30.07 .70	85.9 0.0	41.66 .11	30.1 0.7
35.2	19.25 −.09	61.3 −0.8	48.98 −.89	98.0 −0.8	29.36 −.69	85.5 −0.6	41.56 −.10	29.4 −0.8

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Cassiop.	22 Androm.	σ Androm.	ι Ceti.	6 Urs. Min., S. P.	44 Piscium.	π Androm.	o Cassiop.
	31° 28′ h m 0 3	44° 33′ h m 0 4	53° 50′ h m 0 12	99° 26′ h m 0 13	358° 19′ h m 0 13	88° 41′ h m 0 19	56° 54′ h m 0 30	42° 19′ h m 0 38
	s	s	s	s	s	s	s	s
(Dec. 30.3)	17.29 - .34	35.04 - .22	33.72 - .16	48.06 - .11	82.51 +7.71	44.69 - .12	59.29 - .18	34.73 - .25
Jan. 9.2	16.96 .32	34.83 .21	33.56 .16	47.96 .10	90.27 7.65	44.57 .11	59.11 .16	34.49 .24
19.2	16.65 .30	34.63 .20	33.40 .15	47.86 .09	97.81 7.29	44.48 .09	58.96 .15	34.25 .22
29.2	16.37 - .27	34.44 - .19	33.26 - .13	47.77 - .08	104.85 +6.64	44.39 - .08	58.81 - .14	34.04 - .19
. .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Aug. 26.6	21.60 + .21	38.77 + .18	37.22 + .17	51.38 + .14	48.20 -2.98	47.91 + .14	62.55 + .21	38.20 + .25
Sept. 5.5	21.79 .17	38.93 .13	37.38 .14	51.52 .13	45.67 1.99	48.05 .13	62.74 .16	38.43 .20
15.5	21.93 .11	39.04 .09	37.51 .10	51.65 .11	44.13 -1.01	48.18 .11	62.88 .12	38.59 .15
25.5	22.00 + .04	39.12 + .05	37.59 ,06	51.73 .07	43.65 +0.06	48.26 .07	62.98 .08	38.72 .10
Oct. 5.5	22.01 - .02	39.15 .00	37.62 + .02	51.78 + .03	44.25 1.15	48.32 + .04	63.05 + .04	38.80 .05
15.4	21.97 - .07	39.12 - .04	37.63 - .01	51.79 - .01	45.95 +2.25	48.34 .00	63.07 .00	38.83 + .01
25.4	21.87 .13	39.07 .07	37.60 .04	51.77 .03	48.75 3.34	48.33 - .03	63.06 - .03	38.82 - .03
Nov. 4.4	21.71 .18	38.98 .11	37.54 .08	51.73 .05	52.63 4.39	48.29 .05	63.03 .05	38.77 .07
14.4	21.52 .22	38.84 .14	37.44 .11	51.67 .07	57.53 5.35	48.24 .07	62.96 .08	38.68 .11
24.3	21.27 .26	38.68 .17	37.32 .13	51.58 .09	63.33 6.19	48.16 .08	62.87 .10	38.55 .14
Dec. 4.3	21.00 - .29	38.51 - .18	37.19 - .14	51.49 - .10	69.91 +6.89	48.07 - 09	62.76 - .12	38.38 - .17
14.3	20.70 .31	38.32 .19	37.04 .16	51.39 .11	77.10 7.41	47.98 .10	62.63 .14	38.21 .19
24.2	20.38 .32	38.12 .20	36.87 .17	51.28 .11	84.72 7.70	47.88 .11	62.49 .15	38.01 .20
34.2	20.07 - .30	37.91 - .21	36.71 - .16	51.17 - .10	92.49 +7.72	47.77 - .11	62.33 - .16	37.80 - .21

Mean Solar Date.	δ Piscium.	γ Cassiop.	μ Androm.	43 Cephei.	κ Tucanæ.	f Piscium.	κ Octantis, S. P.	υ Androm.
	83° 1′ h m 0 42	29° 53′ h m 0 50	52° 6′ h m 0 50	4° 20′ h m 0 53	159° 28′ h m 1 12	86° 58′ h m 1 12	184° 47′ h m 1 23	49° 9′ h m 1 30
	s	s	s	s	s	s	s	s
(Dec. 30.3)	57.50 - .11	3.34 - .34	37.89 - .17	47.99 -2.88	2.22 - .55	6.65 - .12	9.94 +2.80	19.81 - .15
Jan. 9.2	57.39 .12	3.00 .35	37.72 .18	45.13 2.85	1.68 .53	6.53 .12	12.76 2.81	19.64 .19
19.2	57.27 .11	2.65 .34	37.54 .18	42.28 2.83	1.15 .51	6.41 .12	15.57 2.75	19.44 .21
29.2	57.16 - .10	2.32 - .33	37.36 - .18	39.48 -2.80	0.65 - .49	6.29 - .12	18.26 +2.64	19.22 - .23
. .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Sept. 5.6	60.71 + .14	7.48 + .26	41.30 + .19	63.09 +1.46	6.51 + .40	9.58 + .18	5.21 -1.65	22.92 + .26
15.5	60.84 .12	7.71 .20	41.47 .15	64.36 1.06	6.87 .32	9.76 .15	3.81 1.17	23.16 .21
25.5	60.95 .09	7.88 .13	41.60 .11	65.21 .65	7.15 .21	9.88 .12	2.87 .72	23.35 .16
Oct. 5.5	61.02 .06	7.98 .08	41.70 .07	65.66 + .24	7.29 + .10	9.99 .09	2.36 - .26	23.49 .12
15.5	61.07 + .03	8.04 + .03	41.74 + .03	65.68 - .20	7.35 .00	10.07 .06	2.36 + .25	23.60 .08
25.4	61.08 .00	8.03 - .04	41.76 .00	65.26 - .63	7.30 - .11	10.11 + .02	2.86 + .74	23.66 + .05
Nov. 4.4	61.06 - .03	7.96 .10	41.74 - .03	64.41 1.06	7.12 .22	10.12 - .01	3.84 1.23	23.70 + .02
14.4	61.04 .05	7.83 .16	41.69 .07	63.13 1.48	6.86 .30	10.10 .03	5.32 1.69	23.69 - .02
24.4	60.98 .07	7.63 .21	41.60 .10	61.45 1.86	6.52 .38	10.07 .05	7.21 2.08	23.65 .06
Dec. 4.3	60.90 .09	7.41 .25	41.49 .12	59.41 2.21	6.09 .45	10.01 .07	9.47 2.40	23.56 .10
14.3	60.81 - .10	7.14 - .29	41.36 - .14	57.04 -2.49	5.62 - .49	9.94 - .09	12.01 +2.63	23.46 - .13
24.3	60.70 .11	6.83 .32	41.20 .16	54.43 2.70	5.12 .51	9.84 .10	14.73 2.77	23.32 .16
34.2	60.59 - .11	6.51 - .34	41.04 - .17	51.65 -2.83	4.60 - .52	9.74 - .11	17.55 +2.82	23.14 - .19

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	π Piscium.	ν Piscium.	ζ Ceti.	γ Androm.	β Trianguli.	4 Urs. Min., S. P.	γ Trianguli.	67 Ceti.
	78° 26′	85° 4′	100° 53′	48° 12′	55° 32′	348° 4′	56° 40′	96° 56′
	h m 1 31	h m 1 35	h m 1 46	h m 1 57	h m 2 2	h m 2 9	h m 2 10	h m 2 11
	s	s	s	s	s	s	s	s
(Dec.30.3)	15.28 − .12	41.73 − .11	1.27 − .12	8.31 − .15	59.40 − .13	14.26 +1.07	46.01 − .12	29.31 − .10
Jan. 9.2	15.16 .12	41.62 .12	1.15 .12	8.15 .17	59.26 .16	15.33 1.11	45.88 .15	29.21 .11
19.2	15.04 .12	41.50 .13	1.03 .13	7.96 .19	59.08 .17	16.47 1.15	45.71 .18	29.09 .13
29.2	14.91 .12	41.37 .12	0.89 .14	7.76 .21	58.91 .18	17.63 1.14	45.53 .18	28.96 .14
Feb. 8.1	14.79 .12	41.25 .11	0.75 .13	7.53 .21	58.72 .18	18.76 1.11	45.36 .17	28.82 .14
18.2	14.66 − .12	41.14 − .10	0.62 − .12	7.34 − .19	58.55 − .16	19.85 +1.07	45.18 − .16	28.68 − .13
. .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Sept.25.6	18.42 + .14	44.83 + .13	4.20 + .16	11.69 + .21	62.59 + .20	12.24 − .54	49.13 + .21	32.07 + .16
Oct. 5.5	18.55 .11	44.95 .11	4.34 .12	11.88 .16	62.77 .16	11.77 .40	49.32 .17	32.22 .13
15.5	18.64 .08	45.05 .08	4.44 .09	12.02 .12	62.91 .12	11.44 .24	49.47 .13	32.34 .11
25.5	18.70 + .05	45.11 + .05	4.53 + .06	12.12 + .08	63.02 + .09	11.29 − .07	49.59 + .10	32.45 + .09
Nov. 4.5	18.73 + .02	45.16 + .03	4.57 + .02	12.19 .05	63.10 .06	11.30 + .11	49.67 .07	32.52 .05
14.5	18.74 − .01	45.17 .00	4.58 − .01	12.22 + .01	63.14 + .02	11.51 .31	49.73 .04	32.55 + .02
24.4	18.72 .03	45.15 − .03	4.57 .03	12.22 − .03	63.14 − .01	11.92 .49	49.74 + .01	32.57 .00
Dec. 4.4	18.68 .05	45.10 .05	4.53 .05	12.16 .07	63.11 .05	12.48 .66	49.72 − .02	32.55 − .03
14.3	18.61 − .08	45.05 − .07	4.48 − .07	12.08 − .10	63.05 − .08	13.23 + .82	49.67 − .06	32.51 − .06
24.3	18.52 .10	44.96 .09	4.39 .09	11.96 .13	62.96 .11	14.11 .96	49.58 .10	32.43 .08
34.2	18.42 − .11	44.86 − .11	4.29 − .11	11.81 − .16	62.83 − .15	15.14 +1.10	49.46 − .13	32.35 − .10

Mean Solar Date.	δ Hydri.	δ Ceti.	μ Hydri.	θ Persei.	σ Arietis.	47 Cephei.	ε Arietis.	β Persei. (*Algol.*)
	159° 10′	90° 9′	169° 36′	41° 15′	75° 23′	11° 1′	69° 6′	49° 28′
	h m 2 19	h m 2 33	h m 2 33	h m 2 36	h m 2 45	h m 2 51	h m 2 52	h m 3 0
	s	s	s	s	s	s	s	s
(Dec.30.4)	48.82 − .52	50.32 − .10	64.47 −1.13	41.01 − .18	24.82 − .08	30.41 − .73	55.02 − .08	60.48 − .10
Jan. 9.3	48.29 .54	50.22 .11	63.32 1.18	40.82 .20	24.73 .11	29.61 .87	54.93 .10	60.37 .14
19.3	47.73 .56	50.11 .12	62.11 1.21	40.61 .22	24.60 .13	28.68 .98	54.81 .13	60.19 .18
29.3	47.16 .56	49.97 .14	60.88 1.20	40.37 .24	24.46 .14	27.66 1.04	54.66 .15	60.00 .20
Feb. 8.2	46.60 .55	49.83 .15	59.68 1.19	40.12 .25	24.32 .14	26.61 1.06	54.50 .16	59.79 .21
18.2	46.06 − .53	49.68 − .15	58.50 −1.17	39.87 − .25	24.17 − .15	25.54 −1.07	54.34 − .16	59.58 − .20
. .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Sept.25.6	51.40 + .37	52.91 + .20	66.52 + .73	44.28 + .29	27.46 + .22	36.33 + .90	57.67 + .20	63.36 + .27
Oct. 5.6	51.72 .27	53.09 .16	67.15 .52	44.55 .25	27.66 .18	37.17 .78	57.87 .19	63.62 .24
15.5	51.94 .17	53.23 .13	67.57 .31	44.78 .20	27.82 .15	37.88 .64	58.06 .17	63.85 .21
25.5	52.06 + .07	53.36 + .11	67.77 + .09	44.95 + .15	27.96 + .12	38.44 + .48	58.22 + .14	64.05 + .17
Nov. 4.5	52.07 − .05	53.45 .08	67.75 − .13	45.08 .11	28.07 .10	38.83 .29	58.34 .10	64.20 .13
14.5	51.96 .16	53.52 .05	67.50 .36	45.17 .07	28.17 .07	39.01 + .11	58.42 .07	64.31 .10
24.4	51.75 .25	53.56 + .02	67.03 .56	45.22 + .02	28.22 + .03	39.05 − .06	58.48 .04	64.40 .06
Dec. 4.4	51.46 .34	53.56 − .01	66.38 − .74	45.21 − .03	28.23 .00	38.89 .26	58.51 + .01	64.43 + .01
14.4	51.08 − .41	53.53 − .04	65.54 − .91	45.15 − .08	28.22 − .03	38.52 − .45	58.50 − .02	64.42 − .03
24.4	50.64 .47	53.49 .06	64.56 1.04	45.04 .13	28.18 .06	37.95 .64	58.46 .05	64.37 .07
34.3	50.14 − .52	53.41 − .10	63.47 −1.16	44.89 − .19	28.10 − .09	37.25 − .78	58.39 − .08	64.25 − .11

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ρ Octantis. S. P.	ι Hydri.	f Tauri.	γ Camelop.	γ Hydri.	ε Persei.	A^1 Tauri.	ο Persei.
	185° 54′	167° 48′	77° 27′	19° 1′	164° 35′	50° 19′	68° 13′	42° 35′
	h m 3 17	h m 3 18	h m 3 24	h m 3 38	h m 3 48	h m 3 50	h m 3 58	h m 4 0
	s	s	s	s	s	s	s	s
(Dec.30.4)	48.31 +2.14	47.22 − .83	47.80 − .06	46.10 − .28	60.90 − .59	28.30 − .06	11.50 − .03	40.71 − .08
Jan. 9.3	50.52 2.28	46.33 .94	47.73 .08	45.77 .38	60.26 .68	28.22 .10	11.45 .07	40.61 .12
19.3	52.88 2.40	45.34 1.03	47.63 .11	45.34 .47	59.53 .77	28.10 .15	11.36 .10	40.47 .17
29.3	55.32 2.46	44.28 1.06	47.49 .14	44.83 .54	58.71 .84	27.92 .18	11.24 .14	40.29 .21
Feb. 8.3	57.79 2.46	43.21 1.07	47.35 .16	44.27 .58	57.86 .87	27.73 .20	11.08 .16	40.06 .24
18.2	60.24 +2.41	42.13 −1.07	47.18 − .17	43.68 − .59	56.97 − .88	27.52 − .21	10.92 − .17	39.82 − .25
28.2	62.58 +2.30	41.08 −1.03	47.02 − .16	43.09 − .58	56.09 − .87	27.30 − .22	10.74 − .18	39.56 − .26
. .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Oct. 5.6	55.28 −1.06	47.42 + .60	50.34 + .22	50.35 + .62	60.18 + .60	31.07 + .32	13.93 + .26	43.57 + .33
15.6	54.34 .77	47.97 .47	50.55 .19	50.93 .54	60.72 .48	31.36 .27	14.18 .23	43.89 .31
25.5	53.75 − .38	48.36 + .29	50.72 + .15	51.43 + .45	61.14 + .36	31.61 + .22	14.40 + .20	44.19 + .28
Nov. 4.5	53.59 + .07	48.54 + .09	50.86 .13	51.83 .36	61.43 .22	31.83 .20	14.59 .18	44.45 .24
14.5	53.89 .49	48.55 − .10	50.99 .11	52.15 .26	61.56 + .06	32.01 .17	14.76 .15	44.67 .20
24.5	54.57 .89	48.35 .28	51.09 .08	52.34 .14	61.55 − .08	32.16 .13	14.89 .11	44.84 .15
Dec. 4.4	55.67 1.30	47.99 .46	51.14 + .04	52.43 + .03	61.39 .23	32.26 .08	14.98 .07	44.96 .10
14.4	57.16 +1.65	47.43 − .63	51.16 .00	52.40 − .08	61.09 − .38	32.31 + .03	15.04 + .04	45.03 + .05
24.4	58.96 1.94	46.74 .77	51.15 − .03	52.26 .20	60.62 .52	32.31 − .02	15.06 .00	45.03 − .01
34.4	61.03 +2.19	45.89 − .87	51.10 − .07	52.00 − .31	60.06 − .61	32.27 − .07	15.04 − .04	44.99 − .06

Mean Solar Date.	ο¹ Eridani.	η Urs. Min., S. P.	δ Mensæ.	m Persei.	τ Tauri.	ι Tauri.	ζ Aurigæ.	β Eridani.
	97° 8′	346° 1′	170° 28′	47° 10′	67° 15′	71° 21′	49° 5′	95° 14′
	h m 4 6	h m 4 20	h m 4 25	h m 4 25	h m 4 35	h m 4 44	h m 4 54	h m 5 2
	s	s	s	s	s	s	s	s
(Dec.30.4)	29.86 − .03	39.31 + .48	34.17 − .85	40.72 − .03	38.64 .00	56.44 + .02	47.57 + .02	26.78 + .02
Jan. 9.4	29.81 .07	39.86 .63	33.20 1.07	40.67 .07	38.62 − .04	56.43 − .03	47.56 − .04	26.77 − .03
19.4	29.72 .10	40 56 .76	32.04 1.23	40 58 .12	38.56 .08	56.38 .07	47.50 .09	26.72 .07
29.3	29.61 .13	41.39 .86	30.75 1.34	40.42 .17	38.45 .12	56.29 .11	47.38 .15	26.63 .10
Feb. 8.3	29.46 .15	42.27 .92	29.36 1.42	40.23 .21	38.31 .15	56.16 .14	47.20 .19	26.51 .14
18.3	29.30 − .17	43.22 + .96	27.90 −1.46	40.01 − .23	38.15 − .17	56.01 − .17	47.00 − .21	26.35 − .17
28.2	29.12 .18	44.19 .95	26.43 1.45	39.78 .23	37.97 .18	55.83 .18	46.78 .22	26.18 .18
Mar. 10.2	28.95 − .17	45.12 + .91	24.99 −1.42	39.55 − .23	37.79 − .18	55.65 − .17	46.55 − .23	26.00 − .19
. .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Oct. 15.6	32.07 + .21	38.94 − .74	30.23 + .89	43.62 + .31	41.10 + .27	58.77 + .25	50.23 + .33	28.62 + .23
25.6	32.27 + .19	38.27 − .60	31.02 + .69	43.92 + .29	41.36 + .25	59.02 + .24	50.55 + .31	28.85 + .22
Nov. 4.6	32.45 .16	37.75 .45	31.61 .48	44.20 .26	41.59 .23	59.27 .23	50.85 .29	29.08 .21
14.5	32.60 .13	37.37 .30	31.97 + .24	44.43 .22	41.80 .19	59.48 .19	51.12 .26	29.28 .19
24.5	32.72 .10	37.15 − .14	32.08 − .02	44.63 .18	41.96 .15	59.65 .15	51.26 .21	29.46 .16
Dec. 4.5	32.80 .06	37.10 + .03	31.93 .27	44.78 .13	42.10 .12	59.79 .12	51.53 .16	29.59 .12
14.4	32.85 + .03	37.22 + .21	31.53 − .51	44.87 + .07	42.20 + .08	59.91 + .09	51.67 + .11	29.70 + .08
24.4	32.86 − .01	37.53 .39	30.90 .75	44.92 + .02	42.25 + .03	59.97 + .05	51.75 + .06	29.76 + .04
34.4	32.83 − .04	38.00 + .55	30.03 − .99	44.91 − .05	42.26 − .01	59.99 .00	51.78 .00	29.78 .00

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	τ Orionis.	χ Aurigæ.	Groombr. 944.	κ Orionis.	ν Aurigæ.	δ Doradus.	β Aurigæ.	θ Aurigæ.
	96° 58′	57° 54′	4° 52′	99° 43′	50° 53′	155° 47′	45° 4′	52° 48′
	h m	h m	h m	h m	h m	h m	h m	h m
	5 12	5 25	5 26	5 42	5 43	5 44	5 51	5 52
	s	s	s	s	s	s	s	s
(Dec.30.4)	16.21 + .02	34.40 + .05	57.44 − .21	32.72 + .06	52.23 + .08	37.94 − .15	28.02 + .09	13.57 + .09
Jan. 9.4	16.21 − .02	34.43 + 01	56.98 .70	32.75 .00	52.28 + .02	37.75 .23	28.08 + .02	13.63 + .03
19.4	16.17 .06	34.41 − .04	56.03 1.15	32.72 − .05	52.27 − .04	37.48 .31	28.07 − .04	13.63 − .03
29.4	16.09 .10	34.34 .10	54.68 1.56	32.66 .09	52.20 .09	37.12 .39	28.00 .10	13.57 .08
Feb. 8.3	15.96 .14	34.22 .15	52.88 1.95	32.55 .12	52.09 .14	36.70 .46	27.88 .15	13.47 .13
18.3	15.81 − .16	34.05 − .18	50.73 −2.25	32.42 − .15	51.92 − .18	36.19 − .52	27.69 − .20	13.31 − .18
28.3	15.64 .17	33.87 .19	48.41 2.37	32.25 .17	51.72 .21	35.66 .55	27.48 .23	13.12 .20
Mar. 10.3	15.46 .18	33.67 .20	45.99 2.44	32.07 .18	51.50 .22	35.09 .57	27.24 .24	12.91 .21
20.2	15.28 − .17	33.46 − .21	43.54 −2.43	31.89 − .18	51.28 − .22	34.52 − .55	26.99 − .25	12.70 − .20
. .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Oct. 25.6	18.21 + .24	37.02 + .30	67.19 +2.56	34.49 + .26	54.86 + .35	36.78 + .47	30.73 + .38	16.12 + .33
Nov. 4.6	18.44 .22	37.31 .28	69.63 2.29	34.74 .24	55.20 .33	37.22 .41	31.10 .36	16.45 .32
14.6	18.65 .20	37.58 .26	71.76 1.95	34.98 .22	55.52 .30	37.59 .33	31.45 .33	16.77 .30
24.5	18.84 .17	37.83 .23	73.52 1.56	35.19 .18	55.80 .26	37.87 .24	31.77 .30	17.05 .27
Dec. 4.5	18.98 .13	38.04 .19	74.87 1.11	35.35 .15	56.05 .22	38.06 .14	32.04 .25	17.31 .23
14.5	19.09 + .09	38.20 + .14	75.74 + .62	35.50 + .12	56.24 + .17	38.15 + 04	32.26 + .19	17.51 + .18
24.5	19.16 .05	38.31 .09	76.11 + .13	35.59 .07	56.38 .12	38.14 − .07	32.42 .13	17.66 .12
34.4	19.19 + .01	38.38 + .04	75.99 − .37	35.64 + .02	56.47 + .07	38.01 − .18	32.52 + .06	17.76 + .06

Mean Solar Date.	η Geminor.	ψ¹ Aurigæ.	ν Geminor.	χ Draconis, S. P.	ε Geminor.	ψ⁵ Aurigæ.	θ Geminor.	ζ Mensæ.
	67° 28′	40° 39′	69° 43′	342° 41′	64° 46′	46° 19′	55° 54′	170° 42′
	h m	h m	h m	h m	h m	h m	h m	h m
	6 8	6 16	6 22	6 22	6 37	6 38	6 45	6 49
	s	s	s	s	s	s	s	s
(Dec.30.5)	14.55 + .09	26.14 + .15	26.15 + .10	58.19 + .04	10.11 + .12	49.00 + .15	32.67 + .14	21.67 − .16
Jan. 9.5	14.62 + .05	26.24 + .06	26.23 + .05	58.29 .16	10.21 .07	49.12 .09	32.79 .10	21.38 .42
19.4	14.64 − .01	26.26 − .01	26.26 .00	58.52 .29	10.26 + .02	49.17 + .02	32.86 + .04	20.84 .66
29.4	14.60 .06	26.21 .08	26.24 − .04	58.88 .43	10.26 − .03	49.16 − .04	32.86 − .02	20.07 .88
Feb. 8.4	14.52 .10	26.10 .14	26.18 .08	59.36 .53	10.20 .07	49.09 .10	32.81 .07	19.09 1.08
18.3	14.41 − .14	25.93 − .19	26.07 − .12	59.93 + .62	10.10 − .11	48.95 − .15	32.72 − .13	17.91 −1.25
28.3	14.25 .16	25.72 .24	25.93 .16	60.60 .70	9.98 .15	48.78 .19	32.56 .17	16.60 1.37
Mar. 10.3	14.08 .18	25.46 .27	25.75 .17	61.34 .74	9.80 .18	48.58 .22	32.38 .19	15.18 1.47
20.3	13.89 .19	25.19 .28	25.57 .18	62.08 .76	9.62 .19	48.35 .24	32.18 .20	13.67 1.53
30.2	13.71 .18	24.91 .27	25.39 .17	62.85 .77	9.43 .19	48.10 .25	31.98 .21	12.13 1.54
Apr. 9.2	13.54 − .17	24.65 − .25	25.22 − .16	63.61 + .76	9.25 − .18	47.86 − .23	31.76 − .22	10.59 −1.52
. .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Nov. 14.6	17.33 + .27	29.61 + .37	28.81 + .28	58.37 − .56	12.82 + .30	52.14 + .36	35.54 + .34	14.41 + .96
24.6	17.59 .24	29.97 .34	29.08 .26	57.86 .45	13.11 .28	52.49 .34	35.87 .31	15.27 .76
Dec. 4.6	17.82 .21	30.30 .30	29.33 .23	57.46 .35	13.38 .25	52.82 .30	36.17 .27	15.92 .53
14.5	18.02 + .17	30.56 + .25	29.53 + .18	57.17 − .22	13.61 + .21	53.09 + .25	36.42 + .23	16.33 + .28
24.5	18.16 .12	30.76 .19	29.70 .14	57.03 − .07	13.80 .16	53.31 .19	36.64 .19	16.48 .00
34.5	18.26 + .07	30.91 + .11	29.81 + .09	57.04 + .08	13.93 + .10	53.48 + .13	36.79 + .13	16.33 − .28

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Geminor.	63 Aurigæ.	25 Camelop.	γ^2 Volantis.	β Can.Min.	26 Lyncis.	Groombr. 1374.	ω^1 Cancri.
	69° 16′ h m 6 57	50° 30′ h m 7 4	7° 23′ h m 7 7	160° 19′ h m 7 9	81° 29′ h m 7 21	42° 9′ h m 7 46	15° 47′ h m 7 47	64° 18′ h m 7 54
	s	s	s	s	s	s	s	s
(Dec.30.5)	35.37 + .15	5.72 + .16	60.67 + .70	44.79 + .06	11.41 + .14	42.53 + .25	3.23 + .54	16.75 + .18
Jan. 9.5	35.49 .10	5.86 .12	61.19 + .34	44.78 − .08	11.53 .10	42.75 .19	3.67 .34	16.92 .15
19.5	35.56 + .04	5.95 + .06	61.35 .00	44.63 .20	11.62 .06	42.90 .12	3.92 .17	17.06 .11
29.4	35.57 − .01	5.97 − .01	61.18 − .35	44.38 .31	11.65 + .01	42.99 + .05	4.01 + .01	17.13 + .05
Feb. 8.4	35.54 .06	5.93 .06	60.66 .68	44.01 .42	11.63 − .04	42.99 − .02	3.93 − .16	17.15 − .01
18.4	35.46 − .10	5.84 − .12	59.83 .96	43.53 − .52	11.57 − .08	42.94 − .08	3.68 − .31	17.11 − .05
28.4	35.33 .14	5.69 .17	58.74 1.20	42.98 .59	11.48 .11	42.81 .15	3.31 .44	17.03 .09
Mar. 10.4	35.18 .16	5.51 .20	57.44 1.37	42.35 .65	11.35 .14	42.63 .20	2.80 .55	16.91 .14
20.3	35.01 .17	5.30 .21	56.00 1.49	41.67 .69	11.19 .16	42.42 .23	2.21 .63	16.76 .16
30.3	34.83 .18	5.08 .22	54.47 1.54	40.98 .70	11.02 .17	42.18 .24	1.55 .67	16.59 .17
Apr. 9.2	34.65 − .18	4.86 − .21	52.92 −1.52	40.30 − .68	10.85 − .16	41.93 − .25	0.86 − .69	16.42 − .17
19.2	34.48 − .17	4.66 − .20	51.42 −1.44	39.63 − .65	10.70 − .14	41.68 − .24	0.17 − .68	16.25 − .16
. .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Nov. 24.6	38.20 + .28	8.97 + .34	69.84 +1.66	43.14 + .47	13.90 + .28	45.81 + .44	8.31 + .93	19.45 + .34
Dec. 4.6	38.47 .25	9.30 .31	71.41 1.47	43.56 .36	14.17 .25	46.23 .40	9.19 .83	19.78 .31
14.6	38.71 + .22	9.60 + .26	72.77 +1.20	43.87 + .25	14.41 + .23	46.60 + .35	9.96 + .72	20.08 + .28
24.5	38.92 .18	9.85 .20	73.81 .89	44.06 + .13	14.63 .19	46.93 .30	10.63 .60	20.35 .23
34.5	39.06 + .13	10.03 + .14	74.54 + .56	44.13 .00	14.78 + .12	47.20 + .25	11.16 + .47	20.57 + .16

Mean Solar Date.	ζ^1 Cancri.	β Cancri.	30 Monocerotis.	θ Chamæleontis.	σ Hydræ.	γ Cancri.	σ^2 Cancri. (*mean.*)	θ Hydræ.
	72° 1′ h m 8 5	80° 28′ h m 8 10	93° 33′ h m 8 20	167° 8′ h m 8 23	86° 16′ h m 8 33	68° 8′ h m 8 36	59° 0′ h m 8 47	87° 13′ h m 9 8
	s	s	s	s	s	s	s	s
(Dec.30.6)	54.37 + .20	33.15 + .18	10.05 + .19	61.76 + .30	0.73 + .21	55.32 + .25	32.07 + .26	38.54 + .25
Jan. 9.6	54.55 .15	33.32 .15	10.22 .15	61.99 + .15	0.92 .17	55.54 .19	32.31 .20	38.77 .20
19.5	54.68 .11	33.46 .11	10.35 .11	62.05 − .02	1.07 .12	55.70 .14	32.51 .14	38.95 .15
29.5	54.77 .06	33.54 .06	10.43 .06	61.94 .21	1.17 .07	55.82 .09	32.64 .10	39.07 .10
Feb. 8.5	54.81 + .01	33.57 + .01	10.46 + .01	61.65 .38	1.22 + .02	55.88 + .04	32.72 + .05	39.16 .06
18.4	54.79 − .04	33.55 − .04	10.45 − .03	61.18 − .55	1.22 − .02	55.90 − .01	32.75 .00	39.20 + .01
28.4	54.72 .09	33.49 .08	10.39 .07	60.55 .70	1.17 .06	55.86 .06	32.72 − .05	39.18 − .03
Mar. 10.4	54.61 .12	33.40 .11	10.29 .11	59.78 .82	1.10 .09	55.78 .10	32.64 .10	39.14 .07
20.4	54.48 .14	33.27 .14	10.17 .14	58.92 .90	0.99 .12	55.66 .13	32.52 .14	39.05 .10
30.3	54.32 .16	33.12 .16	10.02 .16	57.98 .97	0.85 .14	55.53 .15	32.37 .16	38.94 .12
Apr. 9.3	54.16 − .17	32.96 − .17	9.85 − .16	56.98 −1.02	0.70 − .15	55.36 − .17	32.21 − .17	38.81 − .13
19.3	53.99 .15	32.80 .16	9.70 .15	55.95 1.04	0.55 .15	55.20 .16	32.03 .17	38.67 .14
29.3	53.85 .14	32.65 .14	9.55 .14	54.91 1.03	0.40 .14	55.05 .15	31.87 .16	38.53 .14
May 9.6	53.71 − .14	32.52 − .11	9.41 − .13	53.89 −1.00	0.26 − .13	54.90 − .14	31.72 − .15	38.39 − .13

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*β* Argus.	*α* Lyncis.	10 Leonis Minoris.	*o* Leonis.	*ζ* Chamæleontis.	19 Leonis Minoris.	*π* Leonis.	*λ* Ursæ Majoris.
	159° 16′	55° 8′	53° 7′	79° 36′	170° 27′	48° 25′	81° 25′	46° 32′
	9h 11m	9h 14m	9h 27m	9h 35m	9h 37m	9h 50m	9h 54m	10h 10m
	s	s	s	s	s	s	s	s
(Dec.30.6)	62.27 + .40	21.16 + .30	29.05 + .30	16.68 + .27	12.94 + .82	56.72 + .34	23.86 + .27	27.52 + .37
Jan. 9.6	62.61 .28	21.44 .25	29.34 .27	16.93 .23	13.65 .60	57.05 .31	24.12 .24	27.88 .34
19.6	62.83 .16	21.67 .20	29.60 .22	17.14 .18	14.14 .38	57.35 .26	24.35 .20	28.21 .29
29.5	62.93 + .04	21.85 .15	29.79 .16	17.30 .14	14.41 + .15	57.58 .20	24.52 .16	28.46 .23
Feb. 8.5	62.91 − .08	21.96 .09	29.92 .10	17.42 .10	14.43 − .10	57.74 .13	24.66 .11	28.65 .16
18.5	62.78 − .19	22.01 + .03	30.00 + .04	17.49 + .05	14.21 − .32	57.84 + .07	24.74 + .06	28.78 + .09
28.5	62.53 .30	22.02 − .03	30.01 − .02	17.51 .00	13.79 .53	57.89 + .01	24.78 + .02	28.86 + .03
Mar. 10.4	62.19 .38	21.96 .08	29.97 .07	17.48 − .05	13.16 .73	57.87 − .05	24.78 − .03	28.86 − .03
20.4	61.78 .45	21.86 .12	29.88 .11	17.41 .08	12.34 .89	57.80 .10	24.73 .06	28.81 .08
30.4	61.30 .51	21.73 .15	29.75 .15	17.32 .10	11.39 1.03	57.68 .14	24.65 .09	28.70 .12
Apr. 9.3	60.76 − .55	21.56 − .17	29.59 − .17	17.21 − .12	10.28 −1.15	57.53 − .17	24.55 − .11	28.56 − .15
19.3	60.20 .57	21.39 .18	29.42 .18	17.08 .14	9.09 1.23	57.35 .18	24.42 .12	28.39 .17
29.3	59.62 .58	21.21 .17	29.24 .17	16.94 .13	7.82 1.28	57.17 .19	24.30 .13	28.21 .19
May 9.3	59.03 .59	21.04 .16	29.07 .16	16.81 .13	6.52 1.31	56.98 .19	24.17 .13	28.01 .19
19.2	58.44 − .58	20.88 − .15	28.91 − .15	16.68 − .12	5.19 −1.34	56.80 − .18	24.04 − .12	27.83 − .17

Mean Solar Date.	*μ* Hydræ.	*β* Leonis Minoris.	*α* Antliæ.	*β* Octantis, S. P.	41 Leonis Minoris.	$δ^2$ Chamæleontis.	46 Leonis Minoris.	Groombr. 1706.
	106° 16′	52° 43′	120° 30′	188° 2′	66° 14′	169° 57′	55° 11′	11° 38′
	10h 20m	10h 21m	10h 22m	10h 34m	10h 37m	10h 44m	10h 47m	10h 51m
	s	s	s	s	s	s	s	s
Jan. 19.6	46.61 + .23	31.72 + .27	7.60 + .21	37.30 − .64	26.30 + .25	50.47 + .75	9.83 + .30	11.59 + .95
29.6	46.81 .17	31.97 .22	7.79 .17	36.78 .40	26.53 .21	51.12 .55	10.10 .24	12.47 .80
Feb. 8.6	46.95 .12	32.17 .16	7.94 .12	36.50 − .16	26.72 .17	51.56 .33	10.31 .19	13.19 .61
18.5	47.05 .07	32.29 .10	8.03 .07	36.47 + .09	26.86 .12	51.78 + .12	10.47 .14	13.68 .39
28.5	47.10 + .03	32.38 + .05	8.08 + .02	36.67 .32	26.95 .07	51.81 − .08	10.58 .08	13.97 + .18
Mar. 10 5	47.11 − .01	32.39 .00	8.07 − .02	37.11 + .55	26.98 + .02	51.62 − .28	10.63 + .02	14.05 − .03
20.4	47.08 .05	32.37 − .05	8.03 .06	37.77 .78	26.98 − .02	51.26 .46	10.63 − .02	13.91 .23
30.4	47.00 .08	32.29 .10	7.94 .10	38.66 .99	26.93 .06	50.70 .63	10.59 .06	13.59 .42
Apr. 9.4	46.91 .10	32.18 .13	7.83 .12	39.76 1.17	26.85 .09	50.00 .78	10.50 .09	13.08 .58
19.4	46.80 .12	32.04 .15	7.70 .14	41.00 1.32	26.76 .11	49.15 .90	10.40 .12	12.44 .70
29.3	46.68 − .13	31.88 − .16	7.55 − .16	42.42 +1.48	26.64 − .13	48.20 −1.01	10.26 − .14	11.68 − .80
May 9.3	46.55 .13	31.71 .17	7.39 .16	43.96 1.59	26.50 .13	47.14 1.09	10.12 .15	10.85 .86
19.3	46.42 .13	31.55 .16	7.23 .15	45.59 1.67	26.38 .12	46.03 1.14	9.97 .15	9.96 .89
29.3	46.29 .12	31.39 .15	7.08 .14	47.29 1.71	26.25 .12	44.87 1.18	9.82 .14	9.07 .88
June 8.2	46.17 − .11	31.25 − .13	6.94 − .13	49.00 +1.69	26.13 − .11	43.68 −1.21	9.68 − .13	8.20 − .85

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Octantis.	p³ Leonis.	ψ Urs. Maj.	ν Urs. Maj.	ξ Hydræ.	χ Urs. Maj.	π Virginis.	ε Corvi.
	174° 0′	87° 27′	44° 54′	56° 18′	121° 15′	41° 36′	82° 46′	112° 0′
	h m 11 0	h m 11 1	h m 11 3	h m 11 12	h m 11 27	h m 11 40	h m 11 55	h m 12 4
	s	s	s	s	s	s	s	s
Feb. 8.6	15.95 + .66	18.08 + .15	29.30 + .21	33.04 + .22	36.13 + .19	15.38 + .31	14.50 + .22	28.41 + .23
18.6	16 44 + .32	18.22 .12	29.49 .16	33.23 .16	36.30 .15	15.65 .23	14.70 .17	28.62 .19
28.5	16.59 − .01	18.33 .08	29.63 .11	33.35 .10	36.43 .10	15.84 .15	14.85 .13	28.78 .14
Mar. 10.5	16.42 .34	18.38 + .03	29.71 .06	33.44 .05	36.50 .05	15.96 .09	14.96 .09	28.90 .10
20.5	15.90 .66	18.40 − .01	29.74 + .01	33.46 + .01	36.53 + .01	16.03 + .04	15.03 .06	28.97 .06
30.4	15.11 − .94	18.37 − .04	29.73 − .03	33.45 − .03	36.53 − .03	16.04 − .02	15.08 + .03	28.99 + .02
Apr. 9.4	14.03 1.20	18.33 .06	29.67 .07	33.39 .07	36.48 .06	15.98 .07	15.08 − .01	29.02 .00
19.4	12.72 1.44	18.25 .08	29.59 .10	33.31 .10	36.41 .08	15.89 .11	15.05 .05	29.00 − .03
29.4	11.16 1.64	18.17 .09	29.48 .12	33.19 .12	36.32 .10	15.76 .15	14.99 .07	28.96 .06
May 9.3	9.44 1.79	18.07 .10	29.35 .13	33.07 .13	36.20 .12	15.59 .17	14.92 .08	28.88 .08
19.3	7.59 −1.90	17.96 − .11	29.21 − .14	32.92 − .14	36.07 − .13	15.41 − .19	14.85 − .09	28.79 − .09
29.3	5.64 1.98	17.85 .11	29.06 .14	32.77 .15	35.94 .14	15.21 .20	14.76 .10	28.70 .10
June 8.3	3.63 2.00	17.74 .10	28.92 .13	32.63 .14	35.78 .15	15.00 .20	14.65 .11	28.59 .11
18.2	1.64 −1.97	17.64 − .09	28.79 − .12	32.50 − .12	35.64 − .14	14.81 − .19	14.55 − .10	28.48 − .11

Mean Solar Date.	2 Can. Ven.	6 Urs. Min.	δ² Corvi.	β Can. Ven.	γ Virginis, (*mean.*)	31 Comæ Berenices.	γ Cassiop., S. P.	43 Cephei, S. P.
	48° 43′	1° 41′	105° 54′	48° 2′	90° 50′	61° 51′	330° 7′	355° 40′
	h m 12 10	h m 12 14	h m 12 24	h m 12 28	h m 12 36	h m 12 46	h m 12 50	h m 12 53
	s	s	s	s	s	s	s	s
Feb. 8.6	37.44 + .29	51.37 +5.84	10.75 + .24	31.66 + .32	5.39 + .25	20.83 + .27	2.01 − .33	36.97 −2.42
18.6	37.71 .24	56.61 4.63	10.97 .20	31.95 .26	5.62 .20	21.09 .24	1.72 .25	34.76 2.00
28.6	37.93 .18	60.63 3.39	11.14 .16	32.18 .20	5.80 .16	21.32 .20	1.51 .18	32.97 1.58
Mar. 10.5	38.08 .12	63.38 2.04	11.28 .12	32.36 .14	5.94 .12	21.49 .16	1.37 .11	31.60 1.11
20.5	38.18 .07	64.70 +0.62	11.39 .08	32.47 .09	6.05 .10	21.63 .11	1.28 − .04	30.75 .59
30.5	38.23 + .02	64.63 −0.76	11.46 + .04	32.55 + .04	6.14 + .07	21.71 + .07	1.28 + .04	30.43 − .01
Apr. 9.5	38.23 − .02	63.19 2.08	11.48 + .01	32.56 − .01	6.18 + .03	21.77 + .03	1.37 .12	30.73 + .54
19.4	38.19 .06	60.47 3.31	11.47 − .02	32.54 .05	6.19 − .01	21.77 − .01	1.54 .20	31.51 1.05
29.4	38.12 .10	56.58 4.38	11.45 .04	32.47 .08	6.17 .02	21.76 .04	1.78 .29	32.83 1.54
May 9.4	38.00 .13	51.72 5.27	11.40 .06	32.38 .11	6.15 .04	21.70 .06	2.12 .37	34.58 1.95
19.3	37.87 − .15	46.05 −5.97	11.33 − .07	32.25 − .14	6.09 − .06	21.64 − .08	2.51 + .41	36.72 +2 30
29.3	37.71 .16	39.78 6.46	11.25 .08	32.10 .16	6.02 .07	21.54 .10	2.94 .46	39.19 2.59
June 8.3	37.55 .17	33.13 6.75	11.16 .09	31.94 .17	5.94 .09	21.44 .11	3.43 .51	41.89 2.78
18.3	37.38 − .17	26.29 −6.85	11.06 − .10	31.77 − .17	5.84 − .10	21.32 − .12	3.96 + .55	44.74 +2.87

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Muscæ.	ε Virginis.	20 Can. Ven.	κ Octantis.	B.A.C. 4536.	m Virginis.	θ Apodis.	π Hydræ.
	160° 57′	78° 27′	48° 51′	175° 13′	52° 15′	98° 9′	166° 16′	116° 9′
	h m 12 54	h m 12 56	h m 13 12	h m 13 23	h m 13 29	h m 13 35	h m 13 54	h m 14 0
	s	s	s	s	s	s	s	s
Feb. 28.6	45.56 + .42	42.67 + .18	37.50 + .26	25.07 +1.81	53.83 + .28	50.72 + .22	40.24 + .80	6.75 + .24
Mar. 10.6	45.93 .32	42.84 .15	37.73 .20	26.70 1.45	54.08 .22	50.92 .18	40.98 .68	6.98 .22
20.6	46.21 .23	42.98 .11	37.90 .15	27.97 1.08	54.25 .16	51.08 .15	41.60 .55	7.20 .19
30.5	46.38 .12	43.07 .08	38.02 .10	28.85 .69	54.40 .12	51.22 .12	42.08 .42	7.36 .15
Apr. 9.5	46.46 + .02	43.14 .05	38.10 .05	29.35 + .32	54.50 .08	51.33 .09	42.44 .29	7.49 .12
19.5	46.44 − .06	43.17 + .01	38.13 + .01	29.48 − .07	54.55 + .03	51.40 + .06	42.66 + .16	7.60 + .09
29.5	46.34 .15	43.16 − .02	38.12 − .03	29.21 .46	54.56 − .01	51.44 + .03	42.76 + .03	7.68 .06
May 9.4	46.14 .24	43.14 .04	38.07 .07	28.56 .84	54.54 .04	51.46 .00	42.72 − .10	7.72 + .03
19.4	45.87 .31	43.10 .06	37.98 .10	27.52 1.19	54.48 .07	51.45 − .02	42.55 .23	7.74 .00
29.4	45.53 .37	43.03 .07	37.88 .12	25.19 1.48	54.40 .10	51.42 .04	42.26 .35	7.72 − .03
June 8.3	45.13 − .43	42.95 − .08	37.74 − .15	23.55 −1.78	54.28 − .12	51.37 − .06	41.86 − .46	7.69 − .05
18.3	44.66 .48	42.87 .09	37.58 .17	21.62 2.03	54.16 .14	51.31 .08	41.33 .56	7.62 .07
28.3	44.15 .51	42.76 .10	37.41 .17	19.50 2.21	54.00 .16	51.22 .09	40.73 .64	7.54 .09
July 8.3	43.65 − .49	42.65 − .11	37.24 − .16	17.21 −2.33	53.84 − .17	51.12 − .10	40.05 − .71	7.43 − .11

Mean Solar Date.	d Bootis.	κ Virginis.	4 Urs. Min.	δ Octantis.	λ Bootis.	λ Virginis.	μ Hydri, S. P.	α Apodis.
	64° 23′	99° 45′	11° 56′	173° 9′	43° 24′	102° 52′	190° 24′	168° 34′
	h m 14 5	h m 14 7	h m 14 9	h m 14 9	h m 14 12	h m 14 13	h m 14 33	h m 14 34
	s	s	s	s	s	s	s	s
Mar. 20.6	23.86 + .19	2.38 + .17	22.45 + .63	28.75 +1.16	13.42 + .24	10.14 + .18	55.52 − .77	17.57 + .83
30.6	24.03 .14	2.54 .15	22.97 .43	29.76 .92	13.63 .18	10.31 .15	54.81 .64	18.34 .70
Apr. 9.5	24.15 .10	2.68 .12	23.31 .24	30.59 .66	13.78 .13	10.45 .13	54.25 .47	18.97 .55
19.5	24.24 .07	2.78 .09	23.45 + .06	31.11 .39	13.88 .08	10.57 .10	53.88 .27	19.44 .39
29.5	24.31 .05	2.86 .06	23.43 − .13	31.37 + .12	13.94 + .03	10.65 .07	53.71 − .08	19.76 .23
May 9.4	24.34 + .02	2.90 + .03	23.20 − .31	31.35 − .15	13.95 − .02	10.71 + .04	53.72 + .12	19.90 + .07
19.4	24.33 − .01	2.93 + .01	22.82 .46	31.07 .42	13.91 .06	10.73 + .01	53.94 .31	19.90 − .09
29.4	24.29 .04	2.93 − .02	22.28 .60	30.51 .69	13.83 .10	10.74 − .01	54.34 .50	19.72 .26
June 8.4	24.24 .07	2.90 .04	21.62 .72	29.69 .93	13.72 .14	10.71 .03	54.94 .68	19.39 .41
18.3	24.16 .09	2.85 .06	20.85 .81	28.65 1.14	13.56 .17	10.67 .05	55.70 .83	18.90 .55
28.3	24.06 − .11	2.78 − .08	20.00 − .89	27.41 −1.32	13.39 − .19	10.60 − .08	56.60 + .96	18.29 − .68
July 8.3	23.94 .13	2.69 .10	19.08 .94	26.01 1.48	13.19 .20	10.51 .10	57.62 1.09	17.55 .79
18.3	23.81 .15	2.58 .11	18.12 .97	24.46 1.61	12.98 .22	10.40 .11	58.75 1.17	16.71 .88
28.2	23.65 − .16	2.46 − .12	17.14 − .98	22.80 −1.70	12.75 − .23	10.28 − .12	59.95 +1.21	15.80 − .93

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	33 Bootis.	47 Cephei, S. P.	γ Scorpii.	δ Bootis.	ρ Octantis.	β Cor. Bor.	γ Camelop., S. P.	δ¹ Apodis.
	45° 7′	348° 59′	114° 51′	56° 16′	174° 6′	60° 31′	340° 59′	168° 25′
	h m 14 34	h m 14 51	h m 14 57	h m 15 11	h m 15 18	h m 15 23	h m 15 38	h m 16 3
	s	s	s	s	s	s	s	s
Mar. 30.6	46.01 + .19	22.17 − .52	38.77 + .22	5.14 + .22	8.78 +1.73	18.54 + .23	41.57 − .42	58.74 +1.07
Apr. 9.6	46.18 .15	21.75 .32	38.97 .18	5.34 .18	10.36 1.43	18.75 .19	41.21 .29	59.76 .96
19.5	46.31 .11	21.53 − .11	39.13 .16	5.49 .14	11.65 1.14	18.91 .15	41.00 .15	60.66 .83
29.5	46.39 .06	21.52 + .10	39.28 .13	5.62 .11	12.64 .83	19.06 .12	40.91 − .03	61.41 .68
May 9.5	46.44 + .02	21.74 .33	39.38 .09	5.71 .07	13.31 .51	19.16 .08	40.94 + .09	62.02 .53
19.5	46.43 − .03	22.19 + .54	39.46 + .06	5.76 + .03	13.66 + .18	19.23 + .05	41.10 + .22	62.47 + .37
29.4	46.38 .07	22.81 .72	39.51 + .03	5.78 .00	13.66 − .16	19.27 + .01	41.39 .35	62.75 .19
June 8.4	46.29 .10	23.60 .88	39.52 − .01	5.76 − .04	13.33 .49	19.26 − .02	41.80 .47	62.85 + .02
18.4	46.18 .13	24.56 1.02	39.49 .04	5.70 .07	12.68 .80	19.22 .05	42.33 .56	62.78 − .16
28.4	46.03 .17	25.66 1.14	39.45 .07	5.62 .10	11.73 1.10	19.16 .08	42.92 .64	62.52 .34
July 8.3	45.84 − .20	26.84 +1.21	39.37 − .09	5.50 − .13	10.47 −1.38	19.06 − .11	43.60 + .72	62.10 − .48
18.3	45.63 .21	28.08 1.26	39.27 .11	5.35 .15	8.98 1.61	18.93 .14	44.35 .77	61.56 .62
28.3	45.42 .22	29.35 1.28	39.15 .13	5.19 .17	7.26 1.79	18.78 .16	45.13 .79	60.85 .77
Aug. 7.3	45.18 .23	30.64 1.28	39.00 .15	5.01 .19	5.41 1.88	18.61 .18	45.93 .80	60.03 .86
17.2	44.95 .23	31.90 1.25	38.84 .16	4.81 .20	3.50 1.91	18.42 .19	46.73 .79	59.13 .93
27.2	44.72 − .22	33.13 +1.20	38.67 − .17	4.61 − .19	1.59 −1.88	18.23 − .19	47.52 + .77	58.18 − .98

Mean Solar Date.	φ Herculis.	σ Cor. Bor. (*mean.*)	γ Apodis.	η Urs. Min.	η Ophiuchi.	π Herculis.	θ Ophiuchi.	δ Aræ.
	44° 46′	55° 51′	168° 39′	13° 59′	105° 35′	53° 4′	114° 53′	150° 35′
	h m 16 5	h m 16 10	h m 16 16	h m 16 20	h m 17 4	h m 17 11	h m 17 15	h m 17 21
	s	s	s	s	s	s	s	s
Apr. 9.6	19.30 + .24	34.49 + .24	40.07 +1.02	47.56 + .65	4.64 + .28	13.70 + .29	15.68 + .32	11.18 + .53
19.6	19.53 .21	34.71 .20	41.03 .90	48.14 .51	4.91 .25	13.98 .26	15.98 .28	11.69 .49
29.6	19.73 .17	34.89 .16	41.86 .75	48.58 .37	5.15 .23	14.23 .23	16.24 .25	12.16 .45
May 9.6	19.87 .12	35.03 .14	42.53 .60	48.88 .22	5.37 .20	14.44 .20	16.48 .23	12.59 .40
19.5	19.98 .08	35.16 .10	43.06 .44	49.01 + .06	5.56 .18	14.62 .16	16.70 .20	12.96 .34
29.5	20.04 + .04	35.23 + .06	43.41 + .26	49.00 − .09	5.73 + .15	14.76 + .12	16.88 + .17	13.28 + .28
June 8.5	20.05 − .01	35.25 + .02	43.57 + .07	48.83 .24	5.86 .11	14.85 .08	17.04 .14	13.53 .21
18.4	20.02 .06	35.26 − .02	43.55 − .11	48.52 .38	5.96 .08	14.91 + .04	17.16 .10	13.70 .13
28.4	19.93 .11	35.22 .06	43.36 .28	48.06 .52	6.02 + .04	14.92 − .01	17.23 .05	13.80 + .06
July 8.4	19.80 .15	35.14 .10	42.99 .46	47.48 .64	6.03 .00	14.89 .05	17.27 + .01	13.82 − .01
18.4	19.63 − .18	35.02 − .14	42.45 − .61	46.79 − .74	6.03 − .03	14.82 − .10	17.26 − .03	13.77 − .09
28.3	19.43 .21	34.87 .17	41.77 .74	46.01 .82	5.97 .07	14.69 .15	17.21 .06	13.63 .17
Aug. 7.3	19.21 .24	34.69 .19	40.97 .86	45.16 .88	5.88 .10	14.51 .19	17.13 .10	13.44 .23
17.3	18.96 .26	34.49 .21	40.06 .94	44.25 .93	5.76 .13	14.32 .21	17.00 .14	13.18 .29
27.3	18.69 .27	34.27 .22	39.10 .98	43.31 .95	5.61 .16	14.11 .23	16.84 .17	12.86 .33
Sept. 6.2	18.42 − .27	34.06 − .22	38.11 − .97	42.36 − .94	5.45 − .17	13.87 − .24	16.67 − .18	12.51 − .35
16.2	18.15 .26	33.84 .23	37.15 .93	41.42 .91	5.27 .18	13.63 .25	16.48 .19	12.15 .36
26.2	17.90 .24	33.62 .23	36.24 .86	40.55 .85	5.10 .16	13.38 .24	16.30 .18	11.78 .36
Oct. 6.2	17.68 − .21	33.38 − .24	35.43 − .76	39.73 − .76	4.96 − .13	13.15 − .22	16.13 − .17	11.44 − .34

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	Groombr. 944,S.P.	ι Herculis.	θ Herculis.	ο Herculis.	λ Sagittarii.	χ Draconis.	ζ Pavonis.	γ Lyræ.
	355° 8′	43° 56′	52° 44′	61° 15′	115° 29′	17° 19′	161° 31′	57° 28′
	17h 26m	17h 36m	17h 52m	18h 3m	18h 21m	18h 23m	18h 30m	18h 54m
	s	s	s	s	s	s	s	s
May 19.6	33.86 – .46	23.53 + .18	30.36 + .20	16.49 + .21	12.24 + .25	6.03 + .43	14.25 + .64	50.96 + .25
29.6	33.62 – .01	23.69 .14	30.54 .15	16.68 .17	12.48 .23	6.40 .31	14.86 .57	51.20 .22
June 8.5	33.84 + .46	23.81 .10	30.67 .11	16.83 .13	12.70 .20	6.65 .19	15.40 .47	51.41 .18
18.5	34.54 .92	23.88 + .05	30.77 .07	16.94 .09	12.88 .16	6.77 + .06	15.82 .36	51.57 .14
28.5	35.67 1.34	23.91 – .01	30.82 + .03	17.02 .06	13.02 .12	6.76 – .07	16.12 .24	51.69 .10
July 8.5	37.21 +1.73	23.87 – .07	30.83 – .01	17.06 + .02	13.12 + .07	6.62 – .20	16.29 + .12	51.77 + .06
18.4	39.13 2.06	23.78 .12	30.79 .06	17.05 –..03	13.17 + .02	6.37 .32	16.36 .00	51.81 + .01
28.4	41.32 2.36	23.64 .17	30.71 .11	16.99 .08	13.17 – .02	6.01 .43	16.29 – .13	51.79 – .04
Aug. 7.4	43.84 2.63	23.45 .21	30.57 .16	16.89 .12	13.14 .06	5.53 .53	16.10 .25	51.74 .09
17.4	46.57 2.81	23.23 .24	30.39 .19	16.75 .15	13.06 .10	4.95 .61	15.80 .35	51.63 .13
27.3	49.46 +2.95	22.97 – .27	30.19 – .21	16.58 – .18	12.94 – .14	4.29 – .69	15.40 – .45	51.47 – .17
Sept. 6.3	52.47 3.04	22.69 .29	29.97 .23	16.39 .20	12.77 .17	3.57 .75	14.90 .53	51.29 .19
16.3	55.54 3.06	22.40 .30	29,72 .25	16.18 .21	12.61 .18	2.80 .78	14.35 .57	51.08 .21
26.3	58.60 3.03	22.10 .29	29.47 .25	15.96 .22	12.42 .19	2.01 .80	13.77 .59	50.86 .22
Oct. 6.2	61.59 2.95	21.81 .28	29.22 .24	15.74 .22	12.24 .18	1.20 .80	13.18 .59	50.63 .22
16.2	64.50 +2.82	21.54 – .26	28.98 – .23	15.53 – .21	12.06 – .17	0.41 – .77	12.59 – .58	50.40 – .22

Mean Solar Date.	ι Lyræ.	25 Camelop. S. P.	θ Lyræ.	β Cygni.	β Sagittæ.	δ Cygni.	Groombr. 1374,S.P.	ε Pavonis.
	54° 4′	352° 37′	52° 4′	62° 16′	72° 47′	45° 8′	344° 13′	163° 12′
	19h 3m	19h 7m	19h 12m	19h 26m	19h 36m	19h 41m	19h 46m	19h 47m
	s	s	s	s	s	s	s	s
May 29.6	24.09 + .24	47.01 – .62	34.41 + .25	18.39 + .24	7.48 + .26	33.69 + .29	58.04 – .36	54.94 + .80
June 8.6	24.31 .20	46.53 .34	34.64 .21	18.62 .22	7.73 .23	33.96 .25	57.74 .23	55.69 .70
18.6	24.49 .15	46.34 – .05	34.83 .16	18.83 .18	7.95 .21	34.19 .20	57.57 – .10	56.35 .60
28.5	24.61 .10	46.44 + .24	34.96 .12	18.98 .13	8.15 .17	34.36 .14	57.53 + .02	56.90 .49
July 8.5	24.70 .06	46.82 .52	35.06 .07	19.09 .09	8.28 .12	34.47 .09	57.62 .15	57.34 .37
18.5	24.73 + .01	47.48 + .80	35.10 + .02	19.17 + .05	8.38 + .08	34.55 + .04	57.84 + .28	57.65 + .23
28.5	24.72 – .04	48.42 1.06	35.10 – .03	19.19 .00	8.45 + .04	34.55 – .02	58.18 .41	57.80 + .08
Aug. 7.4	24.66 .09	49.59 1.27	35.04 .09	19.17 – .04	8.46 – .01	34.51 .08	58.64 .52	57.82 – .05
17.4	24.55 .14	50.96 1.48	34.92 .14	19.11 .08	8.43 .05	34.40 .13	59.21 .61	57.70 .18
27.4	24.39 .18	52.54 1.67	34.76 .18	19.00 .13	8.35 .09	34.25 .17	59.87 .72	57.45 .31
Sept. 6.3	24.20 – .20	54.31 +1.83	34.57 – .21	18.84 – .17	8.25 – .12	34.05 – .21	60.65 + .81	57.08 – .43
16.3	23.99 .22	56.20 1.94	34.35 .23	18.67 .19	8.11 .15	33.82 .24	61.49 .87	56.58 .53
26.3	23.75 .24	58.18 2.02	34.11 .25	18.47 .20	7.95 .17	33.56 .27	62.39 .93	56.02 .59
Oct. 6.3	23.51 .24	60.24 2.07	33.86 .25	18.26 .21	7.78 .17	33.28 .28	63.35 .98	55.40 .63
16.2	23.27 .23	62.32 2.08	33.61 .24	18.05 .20	7.61 .16	33.00 .28	64.35 1.00	54.76 .65
26.2	23.03 – .21	64.39 +2.03	33.37 – .23	17.85 – .19	7.44 – .15	32.72 – .27	65.34 +1.01	54.11 – .64
Nov. 5.2	22.83 – .19	66.43 +1.96	33.15 – .22	17.66 – .18	7.30 – .13	32.44 – .26	66.36 + .99	53.49 – .60

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Sagittæ.	o Sagittarii.	θ Aquilæ.	31 Cygni.	α Delphini.	β Pavonis.	ψ Capricor.	ε Cygni.
	70° 49′ h m 19 53	118° 1′ h m 19 55	91° 9′ h m 20 5	43° 36′ h m 20 10	74° 29′ h m 20 34	156° 36′ h m 20 35	115° 40′ h m 20 39	56° 27′ h m 20 41
	s	s	s	s	s	s	s	s
June 18.6	53.50 + .19	55.35 + .25	39.25 + .21	11.93 + .23	33.15 + .23	5.79 + .54	36.42 + .27	47.14 + .26
28.6	53.68 .16	55.59 .21	39.45 .18	12.14 .18	33.37 .20	6.29 .46	36.68 .24	47.38 .22
July 8.5	53.83 .13	55.77 .17	39.62 .15	12.30 .13	33.56 .16	6.72 .39	36.91 .21	47.58 .17
18.5	53.94 .09	55.93 .13	39.75 .11	12.41 .07	33.70 .12	7.07 .30	37.10 .17	47.72 .12
28.5	54.00 + .04	56.03 .08	39.85 .07	12.44 + .01	33.80 .08	7.33 .20	37.24 .12	47.82 .07
Aug. 7.5	54.02 .00	56.09 + .03	39.89 + .02	12.44 − .04	33.86 + .04	7.46 + .09	37.34 + .07	47.87 + .02
17.4	54.00 − .04	56.08 − .02	39.89 − .02	12.37 .10	33.89 .00	7.49 − .01	37.38 + .02	47.87 − .02
27.4	53.93 .09	56.03 .06	39.85 .06	12.25 .15	33.86 − .05	7.43 .12	37.38 − .03	47.83 .07
Sept. 6.4	53.82 .13	55.95 .10	39.78 .09	12.06 .20	33.79 .09	7.25 .22	37.33 .07	47.73 .11
16.4	53.69 .15	55.82 .14	39.67 .12	11.85 .23	33.69 .12	6.99 .30	37.25 .11	47.60 .15
26.3	53.51 − .17	55.66 − .17	39.53 − .15	11.60 − .26	33.55 − .15	6.66 − .36	37.12 − .14	47.42 − .18
Oct. 6.3	53.34 .18	55.49 .18	39.37 .16	11.33 .28	33.39 .16	6.27 .41	36.97 .16	47.24 .20
16.3	53.16 .19	55.31 .18	39.22 .16	11.04 .29	33.23 .17	5.84 .44	36.80 .17	47.03 .21
26.3	52.97 .18	55.13 .17	39.06 .15	10.76 .28	33.06 .16	5.39 .45	36.64 .17	46.83 .21
Nov. 5.2	52.80 .16	54.97 .15	38.91 .14	10.48 .27	32.90 .15	4.94 .43	36.47 .16	46.62 .20
15.2	52.66 − .14	54.84 − .12	38.78 − .12	10.22 − .25	32.76 − .14	4.52 − .40	36.34 − .14	46.42 − .19
25.2	52.55 − .11	54.73 − .09	38.68 − .09	9.98 − .23	32.62 − .13	4.14 − .36	36.20 − .13	46.24 − .17

Mean Solar Date.	τ Cygni.	ζ Capricor.	74 Cygni.	λ¹ Octantis.	ζ Chamæleontis, S.P.	π² Cygni.	16 Pegasi.	π Pegasi.
	52° 26′ h m 21 10	112° 53′ h m 21 20	50° 5′ h m 21 32	173° 14′ h m 21 34	189° 33′ h m 21 36	41° 12′ h m 21 42	64° 36′ h m 21 48	57° 22′ h m 22 5
	s	s	s	s	s	s	s	s
July 8.6	25.91 + .20	25.03 + .24	34.23 + .23	9.61 +1.45	59.43 − .81	45.73 + .28	5.05 + .24	7.74 + .26
18.6	26.09 .16	25.25 .20	34.44 .18	10.92 1.17	58.67 .68	45.97 .21	5.27 .19	7.98 .21
28.5	26.22 .11	25.43 .15	34.59 .13	11.95 .88	58.07 .49	46.14 .15	5.44 .14	8.17 .16
Aug. 7.5	26.31 + .06	25.56 .10	34.71 .09	12.68 .56	57.70 .27	46.26 .09	5.56 .10	8.31 .12
17.5	26.34 .00	25.64 .05	34.76 + .03	13.07 + .22	57.54 − .06	46.32 + .03	5.65 .06	8.41 .07
27.5	26.31 − .05	25.67 + .01	34.76 − .02	13.13 − .11	57.59 + .18	46.31 − .02	5.69 + .02	8.46 + .02
Sept. 6.4	26.24 .09	25.67 − .03	34.71 .07	12.85 .44	57.91 .42	46.27 .07	5.68 − .03	8.46 − .02
16.4	26.13 .13	25.62 .07	34.62 .11	12.25 .77	58.43 .63	46.17 .13	5.63 .07	8.43 .06
26.4	25.97 .17	25.52 .10	34.49 .15	11.31 1.07	59.16 .83	45.99 .19	5.54 .10	8.35 .10
Oct. 6.4	25.79 .20	25.41 .13	34.31 .19	10.12 1.30	60.09 1.02	45.79 .22	5.42 .13	8.24 .13
16.3	25.58 − .21	25.27 − .15	34.11 − .21	8.71 −1.48	61.20 +1.17	45.56 − .24	5.29 − .15	8.09 − .16
26.3	25.37 .21	25.11 .16	33.90 .22	7.16 1.60	62.43 1.26	45.32 .25	5.12 .17	7.92 .17
Nov. 5.3	25.16 .21	24.95 .15	33.69 .22	5.51 1.65	63.73 1.33	45.06 .27	4.96 .17	7.75 .18
15.3	24.95 .20	24.81 .14	33.47 .21	3.85 1.64	65.09 1.35	44.78 .27	4.79 .16	7.57 .18
25.2	24.75 .19	24.68 .13	33.27 .20	2.22 1.58	66.43 1.31	44.52 .26	4.65 .14	7.39 .17
Dec. 5.2	24.57 − .17	24.56 − .12	33.07 − .19	0.69 −1.45	67.70 +1.22	44.27 − .24	4.51 − .12	7.23 − .15

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ν Octantis.	γ Aquarii.	σ Aquarii.	α Lacertæ.	10 Lacertæ.	β Octantis.	λ Pegasi.	Groombr. 1706, S.P.
	176° 32′	91° 57′	101° 15′	40° 17′	51° 32′	171° 58′	67° 1′	348° 22′
	h m 22 10	h m 22 15	h m 22 24	h m 22 26	h m 22 34	h m 22 34	h m 22 41	h m 22 51
	s	s	s	s	s	s	s	s
July 8.6	43.49 +3.08	59.97 + .26	50.96 + .26	47.30 + .32	21.05 + .29	53.91 +1.40	15.35 + .27	5.92 − .64
18.6	46.33 2.60	60.21 .22	51.21 .23	47.60 .27	21.32 .25	55.27 1.28	15.61 .24	5.35 .50
28.6	48.68 2.09	60.41 .18	51.43 .20	47.85 .21	21.55 .21	56.47 1.08	15.84 .20	4.93 .36
Aug. 7.6	50.50 1.52	60.57 .14	51.62 .16	48.02 .15	21.73 .16	57.43 .84	16.02 .16	4.63 .24
17.5	51.72 .90	60.70 .10	51.74 .11	48.15 .10	21.87 .11	58.15 .58	16.15 .12	4.46 − .10
27.5	52.30 + .25	60.78 + .06	51.83 + .07	48.21 + .04	21.95 + .06	58.59 + .30	16.25 + .08	4.44 + .05
Sept. 6.5	52.22 − .42	60.82 + .02	51.89 + .03	48.23 − .01	21.98 + .01	58.75 + .01	16.31 + .04	4.57 .21
16.5	51.46 1.05	60.82 − .02	51.90 − .01	48.19 .07	21.97 − .03	58.61 − .28	16.32 − .01	4.87 .38
26.4	50.12 1.65	60.78 .05	51.87 .04	48.09 .12	21.92 .07	58.18 .56	16.29 .05	5.33 .53
Oct. 6.4	48.17 2.21	60.72 .08	51.81 .07	47.96 .17	21.82 .11	57.50 .79	16.23 .08	5.93 .67
16.4	45.70 −2.66	60.63 − .10	51.73 − .10	47.76 − .20	21.69 − .14	56.60 −1.00	16.13 − .10	6.66 + .81
26.3	42.85 3.01	60.52 .11	51.61 .12	47.56 .22	21.54 .16	55.50 1.18	16.03 .12	7.57 .95
Nov. 5.3	39.68 3.25	60.40 .12	51.50 .12	47.33 .24	21.37 .18	54.24 1.31	15.90 .13	8.57 1.06
15.3	36.36 3.34	60.27 .12	51.37 .13	47.07 .26	21.17 .19	52.88 1.38	15.77 .14	9.69 1.17
25.3	33.00 3.32	60.16 .12	51.24 .12	46.82 .26	20.99 .19	51.47 1.39	15.62 .15	10.91 1.23
Dec. 5.2	29.73 −3.15	60.04 − .11	51.13 − .11	46.56 − .25	20.80 − .19	50.10 −1.35	15.48 − .14	12.16 +1.26
15.2	26.70 −2.85	59.94 − .09	51.02 − .10	46.32 − .23	20.61 − .18	48.77 −1.28	15.35 − .13	13.43 +1.28

Mean Solar Date.	o Androm.	φ Aquarii.	τ Pegasi.	λ Androm.	i¹ Aquarii.	δ Sculptoris.	γ¹ Octantis.	33 Piscium.
	48° 16′	96° 39′	66° 52′	44° 9′	108° 54′	118° 45′	172° 38′	96° 20′
	h m 22 56	h m 23 8	h m 23 15	h m 23 32	h m 23 38	h m 23 43	h m 23 45	h m 23 59
	s	s	s	s	s	s	s	s
July 28.6	53.59 + .25	39.33 + .23	13.30 + .22	12.79 + .28	31.51 + .27	13.57 + .29	45.23 +1.48	43.86 + .25
Aug. 7.6	53.81 .19	39.54 .19	13.51 .19	13.06 .24	31.76 .23	13.84 .24	46.62 1.29	44.10 .23
17.6	53.97 .14	39.71 .15	13.69 .15	13.28 .19	31.97 .18	14.06 .20	47.80 1.06	44.32 .20
27.5	54.08 .09	39.84 .11	13.81 .10	13.43 .14	32.13 .14	14.25 .16	48.73 .79	44.50 .16
Sept. 6.5	54.15 + .04	39.93 .07	13.90 .06	13.55 .10	32.26 .11	14.39 .12	49.37 .49	44.63 .12
16.5	54.16 − .01	39.99 + .04	13.95 + .03	13.62 + .04	32.35 + .07	14.48 + .07	49.71 + .20	44.73 + .09
26.5	54.13 .05	40.00 .00	13.97 .00	13.63 − .01	32.40 + .03	14.53 + .03	49.76 − .12	44.81 .05
Oct. 6.4	54.06 .09	39.99 − .03	13.94 − .04	13.61 .05	32.40 − .01	14.55 − .01	49.47 .43	44.83 + .01
16.4	53.95 .12	39.94 .06	13.89 .07	13.54 .09	32.36 .04	14.51 .05	48.89 .72	44.83 − .02
26.4	53.82 .15	39.87 .08	13.80 .10	13.43 .13	32.32 .06	14.45 .08	48.03 .98	44.80 .05
Nov. 5.4	53.64 − .18	39.77 − .10	13.70 − .11	13.29 − .16	32.24 − .09	14.36 − .10	46.92 −1.21	44.74 − .07
15.3	53.46 .19	39.67 .11	13.58 .12	13.11 .18	32.14 .11	14.25 .12	45.62 1.38	44.67 .08
25.3	53.27 .20	39.56 .11	13.45 .13	12.92 .19	32.03 .12	14.13 .13	44.17 1.49	44.58 .09
Dec. 5.3	53.06 .20	39.45 .10	13.32 .13	12.72 .20	31.91 .12	13.99 .14	42.64 1.56	44.48 .10
15.3	52.87 .19	39.34 .10	13.19 .13	12.51 .21	31.80 .12	13.86 .14	41.06 1.57	44.38 .11
25.2	52.69 − .19	39.25 − .09	13.06 − .12	12.30 − .21	31.68 − .11	13.72 − .13	39.51 −1.50	44.27 − .11
35.2	52.50 − .18	39.17 − .08	12.94 − .11	12.09 − .21	31.58 − .09	13.59 − .12	38.06 −1.39	44.16 − .10

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Jan. 1	18 49 11.67	12.40	−22 58 17.6	16.8	11.030	+12.98	+ 3 59.95	16 18.43	1 11.07	18 45 11.79
2	18 53 36.20	37.03	22 52 52.8	51.8	11.014	14.11	4 27.94	16 18.43	1 11.02	18 49 8.35
3	18 58 0.36	1.27	22 46 60.7	59.5	10.997	15.23	4 55.54	16 18.43	1 10.97	18 53 4.91
4	19 2 24.11	25.10	22 40 41.4	40.0	10.980	16.36	5 22.73	16 18.42	1 10.91	18 57 1.47
5	19 6 47.41	48.48	22 33 55.2	53.6	10.961	17.48	5 49.49	16 18.40	1 10.85	19 0 58.03
6	19 11 10.26	11.41	−22 26 42.3	40.4	10.942	+18.59	+ 6 15.79	16 18.37	1 10.79	19 4 54.59
7	19 15 32.63	33.85	22 19 2.9	0.7	10.922	19.68	6 41.60	16 18.34	1 10.72	19 8 51.14
8	19 19 54.49	55.78	22 10 57.2	54.7	10.900	20.77	7 6.91	16 18.30	1 10.65	19 12 47.70
9	19 24 15.83	17.19	22 2 25.4	22.6	10.878	21.85	7 31.70	16 18.26	1 10.57	19 16 44.26
10	19 28 36.63	38.06	21 53 27.8	24.7	10.855	22.93	7 55.94	16 18.21	1 10.49	19 20 40.82
11	19 32 56.86	58.36	−21 44 4.6	1.2	10.831	+23.99	+ 8 19.62	16 18.16	1 10.41	19 24 37.37
12	19 37 16.50	18.07	21 34 16.1	12.4	10.806	25.04	8 42.71	16 18.10	1 10.33	19 28 33.93
13	19 41 35.53	37.16	21 23 62.7	58.6	10.780	26.08	9 5.18	16 18.04	1 10.25	19 32 30.49
14	19 45 53.93	55.62	21 13 24.4	20.1	10.753	27.10	9 27.02	16 17.96	1 10.16	19 36 27.05
15	19 50 11.69	13.44	21 2 21.7	17.1	10.726	28.11	9 48.23	16 17.88	1 10.07	19 40 23.60
16	19 54 28.79	30.60	−20 50 54.8	49.9	10.698	+29.11	+10 8.77	16 17.80	1 9.97	19 44 20.16
17	19 58 45.19	47.05	20 38 64.1	58.8	10.669	30.10	10 28.62	16 17.72	1 9.87	19 48 16.71
18	20 3 0.88	2.79	20 26 49.9	44.3	10.640	31.08	10 47.76	16 17.63	1 9.77	19 52 13.27
19	20 7 15.86	17.82	20 14 12.6	6.7	10.609	32.03	11 6.17	16 17.54	1 9.67	19 56 9.83
20	20 11 30.09	32.10	20 1 12.4	6.2	10.578	32.98	11 23.84	16 17.44	1 9.56	20 0 6.39
21	20 15 43.57	45.62	−19 47 49.7	43.2	10.546	+33.91	+11 40.76	16 17.34	1 9.46	20 4 2.94
22	20 19 56.27	58.36	19 33 65.0	58.1	10.514	34.82	11 56.90	16 17.24	1 9.35	20 7 59.50
23	20 24 8.18	10.31	19 19 58.5	51.3	10.481	35.72	12 12.25	16 17.14	1 9.24	20 11 56.06
24	20 28 19.29	21.45	19 5 30.6	23.0	10.447	36.60	12 26.80	16 17.03	1 9.13	20 15 52.62
25	20 32 29.58	31.78	18 50 41.7	33.8	10.413	37.46	12 40.53	16 16.91	1 9.02	20 19 49.17
26	20 36 39.05	41.28	−18 35 32.3	24.1	10.378	+38.31	+12 53.44	16 16.79	1 8.91	20 23 45.73
27	20 40 47.70	49.96	18 19 62.9	54.3	10.343	39.15	13 5.52	16 16.67	1 8.80	20 27 42.28
28	20 44 55.51	57.79	18 4 13.4	4.6	10.308	39.96	13 16.77	16 16.55	1 8.68	20 31 38.84
29	20 49 2.48	4.78	17 47 64.7	55.6	10.273	40.76	13 27.18	16 16.42	1 8.57	20 35 35.39
30	20 53 8.61	10.93	17 31 37.1	27.7	10.238	41.54	13 36.75	16 16.29	1 8.45	20 39 31.95
31	20 57 13.90	16.24	−17 14 50.9	41.2	10.203	+42.31	+13 45.48	16 16.15	1 8.34	20 43 28.50
Feb. 1	21 1 18.35	20.70	16 57 46.5	36.5	10.168	43.06	13 53.37	16 16.01	1 8.22	20 47 25.06
2	21 5 21.96	24.32	16 40 24.3	14.0	10.134	43 78	14 0.42	16 15.86	1 8.11	20 51 21.61
3	21 9 24.75	27.12	16 22 44.8	34.3	10.100	44.50	14 6.64	16 15.71	1 7.99	20 55 18.17
4	21 13 26.72	29.10	16 4 48.3	37.6	10.066	45.20	14 12.05	16 15.54	1 7.88	20 59 14.72
5	21 17 27.88	30.26	−15 46 35.3	24.4	10.032	+45.87	+14 16.64	16 15.37	1 7.76	21 3 11.28
6	21 21 28.23	30.61	15 27 66.2	55.1	9.998	46.54	14 20.43	16 15.20	1 7.65	21 7 7.83
7	21 25 27.78	30.16	15 9 21.3	10.0	9.965	47.19	14 23.42	16 15.02	1 7.53	21 11 4.39
8	21 29 26.55	28.93	14 50 20.9	9.4	9.933	47.82	14 25.62	16 14.84	1 7.42	21 15 0.94
9	21 33 24.54	26.92	14 30 65.6	53.9	9.901	48.44	14 27.05	16 14.66	1 7.31	21 18 57.50
10	21 37 21.77	24.15	−14 11 35.8	23.9	9.869	+49.04	+14 27.72	16 14.47	1 7.20	21 22 54.05
11	21 41 18.25	20.62	13 51 51.8	39.8	9.838	49.62	14 27.63	16 14.28	1 7.09	21 26 50.61
12	21 45 13.98	16.34	13 31 54.1	42.0	9.807	50.19	14 26.80	16 14.08	1 6.98	21 30 47.16
13	21 49 8.97	11.32	13 11 43.1	30.9	9.777	50.74	14 25.23	16 13.88	1 6.87	21 34 43.72
14	21 53 3.23	5.57	12 51 19.1	6.8	9.747	51.27	14 22.95	16 13.68	1 6.76	21 38 40.27
15	21 56 56.78	59.10	−12 30 42.6	30.2	9.717	+51.79	+14 19.94	16 13.47	1 6.66	21 42 36.83
16	22 0 49.62	51.93	−12 9 53.9	41.4	9.687	+52.28	+14 16.21	16 13.26	1 6.56	21 46 33.38

Note.—For mean time interval of semidiameter passing meridian, subtract $0^{s}.19$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Decli-nation.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Feb. 16	22 0 49.62	51.93	−12 9 53.9	41.4	9.687	+52.28	+14 16.21	16 13.26	1 6.56	21 46 33.38
17	22 4 41.77	44.06	11 48 53.5	41.0	9.658	52.76	14 11.78	16 13.04	1 6.46	21 50 29.94
18	22 8 33.22	35.49	11 27 42.0	29.4	9.630	53 21	14 6.67	16 12.82	1 6.36	21 54 26.49
19	22 12 23.99	26.24	11 6 19.7	7.1	9.602	53.65	14 0.89	16 12.60	1 6.26	21 58 23.05
20	22 16 14.09	16.31	10 44 46.9	34.3	9.574	54.08	13 54.43	16 12.38	1 6.16	22 2 19.60
21	22 20 3.54	5.73	−10 22 64.1	51.5	9.547	+54.48	+13 47.31	16 12.16	1 6.07	22 6 16.15
22	22 23 52.34	54.50	10 0 71.8	59.2	9.520	54.87	13 39.56	16 11.94	1 5.98	22 10 12.70
23	22 27 40.50	42.63	9 38 70.4	57.9	9.494	55.24	13 31.16	16 11.71	1 5.89	22 14 9.26
24	22 31 28.04	30.14	9 16 60.4	47.9	9.469	55.59	13 22.14	16 11.49	1 5.80	22 18 5.81
25	22 35 14.97	17.04	8 54 42.1	29.7	9.444	55.93	13 12.51	16 11.26	1 5.71	22 22 2.37
26	22 39 1.31	3.35	− 8 32 15.9	3.6	9.420	+56.25	+13 2.30	16 11.03	1 5.62	22 25 58.92
27	22 42 47.08	49.09	8 9 42.3	30.1	9.396	56.55	12 51.52	16 10.80	1 5.54	22 29 55.47
28	22 46 32.30	34.28	7 46 61.7	49.6	9.373	56.83	12 40.19	16 10.57	1 5.47	22 33 52.02
Mar. 1	22 50 16.99	18.93	7 24 14.5	2.5	9.351	57.10	12 28.32	16 10.33	1 5.40	22 37 48.58
2	22 54 1.15	3.06	7 1 21.0	9.2	9.330	57.36	12 15.92	16 10.09	1 5.33	22 41 45.13
3	22 57 44.81	46.69	− 6 38 21.7	10.1	9.310	+57.59	+12 3.03	16 9.84	1 5.26	22 45 41.69
4	23 1 28.01	29.84	6 15 16.9	5.5	9.291	57.80	11 49.67	16 9.60	1 5.19	22 49 38.24
5	23 5 10.76	12.55	5 51 67.0	55.8	9.272	58.00	11 35.86	16 9.35	1 5.13	22 53 34.80
6	23 8 53.08	54.83	5 28 52.5	41.4	9.255	58.19	11 21.62	16 9.09	1 5.07	22 57 31.35
7	23 12 34.99	36.70	5 5 33.7	22.7	9.239	58.37	11 6.99	16 8.83	1 5.01	23 1 27.90
8	23 16 16.53	18.20	− 4 42 10.7	0.0	9.224	+58.53	+10 51.97	16 8.57	1 4.95	23 5 24.45
9	23 19 57.71	59.34	4 18 44.0	33.6	9.209	58.68	10 36.59	16 8.30	1 4.90	23 9 21.01
10	23 23 38.55	40.14	3 55 14.1	3.9	9.196	58.81	10 20.88	16 8.03	1 4.85	23 13 17.56
11	23 27 19.09	20.64	3 31 41.3	31.4	9.183	58.92	10 4.87	16 7.76	1 4.81	23 17 14.11
12	23 30 59.34	60.85	3 7 65.9	56.2	9.172	59.02	9 48.56	16 7.49	1 4.76	23 21 10.66
13	23 34 39.31	40.77	− 2 44 28.3	18.9	9.161	+59.10	+ 9 31.98	16 7.22	1 4.72	23 25 7.22
14	23 38 19.03	20.45	2 20 48.9	39.7	9.151	59.17	9 15.15	16 6.95	1 4.68	23 29 3.77
15	23 41 58.53	59.90	1 56 68.0	59.1	9.141	59.23	8 58.10	16 6.67	1 4.64	23 33 0.32
16	23 45 37.82	39.14	1 33 26.0	17.4	9.133	59.27	8 40.84	16 6.40	1 4.61	23 36 56.87
17	23 49 16.91	18.19	1 9 43.2	34.9	9.126	59.29	8 23.39	16 6.12	1 4.58	23 40 53.43
18	23 52 55.83	57.07	− 0 45 60.1	52.1	9.119	+59.30	+ 8 5.76	16 5.85	1 4.56	23 44 49.98
19	23 56 34.60	35.79	− 0 22 17.1	9.4	9.113	59.28	7 47.97	16 5.57	1 4.54	23 48 46.53
20	0 0 13.23	14.37	+ 0 1 25.6	33.0	9.107	59.26	7 30.05	16 5.30	1 4.52	23 52 43.08
21	0 3 51.74	52.83	0 25 7.5	14.6	9.102	59.22	7 12.01	16 5.02	1 4.50	23 56 39.64
22	0 7 30.14	31.18	0 48 48.3	55.1	9.098	59.16	6 53.86	16 4.75	1 4.49	0 0 36.19
23	0 11 8.45	9.45	+ 1 12 27.4	33.9	9.095	+59.09	+ 6 35.62	16 4.47	1 4.48	0 4 32.75
24	0 14 46.68	47.64	1 36 4.6	10.8	9.093	59.00	6 17.30	16 4.20	1 4.48	0 8 29.30
25	0 18 24.86	25.78	1 59 39.6	45.4	9.091	58.89	5 58.94	16 3.93	1 4.47	0 12 25.85
26	0 22 3.01	3.88	2 23 11.8	17.3	9.090	58.77	5 40.54	16 3.66	1 4.47	0 16 22.40
27	0 25 41.14	41.96	2 46 40.9	46.1	9.089	58.64	5 22.12	16 3.38	1 4.47	0 20 18.96
28	0 29 19.27	20.04	+ 3 10 6.5	11.4	9.089	+58.49	+ 5 3.71	16 3.11	1 4.47	0 24 15.51
29	0 32 57.42	58.14	3 33 28.3	32.9	9.090	58.32	4 45.31	16 2.84	1 4.48	0 28 12.06
30	0 36 35.61	36.28	3 56 46.0	50.3	9.092	58.14	4 26.94	16 2.57	1 4.49	0 32 8.61
31	0 40 13.86	14.49	4 19 59.3	63.3	9.095	57.95	4 8.64	16 2.29	1 4.50	0 36 5.17
32	0 43 52.20	52.78	4 43 7.7	11.4	9.099	57.74	3 50.43	16 2.02	1 4.51	0 40 1.72
33	0 47 30.65	31.19	+ 5 6 11.0	14.4	9.104	+57.52	+ 3 32.33	16 1.75	1 4.53	0 43 58.27
34	0 51 9.23	9.72	+ 5 29 8.8	11.9	9.110	+57.28	+ 3 14.36	16 1.47	1 4.55	0 47 54.82

Note.—For mean time interval of semidiameter passing meridian, subtract 0ˢ.18 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Apr. 1	0 43 52.20	52.78	+ 4 43 7.7	11.4	9.099	+57.74	+3 50.43	16 2.02	1 4.51	0 40 1.72
2	0 47 30.65	31.19	5 6 11.0	14.4	9.104	57.52	3 32.33	16 1.75	1 4.53	0 43 58.27
3	0 51 9.23	9.72	5 29 8.8	11.9	9.110	57.28	3 14.36	16 1.47	1 4.55	0 47 54.82
4	0 54 47.95	48.40	5 52 0.7	3.5	9.117	57.03	2 56.53	16 1.19	1 4.58	0 51 51.38
5	0 58 26.84	27.25	6 14 46.6	49.1	9.125	56.77	2 38.87	16 0.91	1 4.61	0 55 47.93
6	1 2 5.94	6.30	+ 6 37 26.0	28.2	9.133	+56.50	+2 21.41	16 0.64	1 4.64	0 59 44.49
7	1 5 45.25	45.56	6 59 58.6	60.5	9.143	56.22	2 4.17	16 0.36	1 4.67	1 3 41.04
8	1 9 24.79	25.06	7 22 21.1	25.7	9.153	55.91	1 47.17	16 0.08	1 4.71	1 7 37.59
9	1 13 4.58	4.81	7 44 42.2	43.6	9.165	55.60	1 30.43	15 59.80	1 4.74	1 11 34.14
10	1 16 44.66	44.85	8 6 52.6	53.8	9.177	55.27	1 13.96	15 59.53	1 4.78	1 15 30.70
11	1 20 25.04	25.19	+ 8 28 55.0	55.9	9.189	+54.92	+0 57.79	15 59.25	1 4.82	1 19 27.25
12	1 24 5.74	5.85	8 50 49.1	49.7	9.202	54.57	0 41.94	15 58.98	1 4.87	1 23 23.81
13	1 27 46.76	46.83	9 12 34.4	34.8	9.216	54.20	0 26.41	15 58.70	1 4.91	1 27 20.36
14	1 31 28.13	28.16	9 34 10.6	10.8	9.231	53.82	+0 11.23	15 58.43	1 4.96	1 31 16.91
15	1 35 9.85	9.84	9 55 37.5	37.5	9.246	53.42	−0 3.60	15 58.15	1 5.01	1 35 13.46
16	1 38 51.95	51.90	+10 16 54.7	54.5	9.262	+53.01	−0 18.06	15 57.88	1 5.07	1 39 10.02
17	1 42 34.43	34.35	10 38 1.8	1.4	9.278	52.58	0 32.13	15 57.61	1 5.12	1 43 6.57
18	1 46 17.31	17.19	10 58 58.4	57.8	9.295	52.15	0 45.81	15 57.35	1 5.18	1 47 3.13
19	1 50 0.59	0.43	11 19 44.3	43.6	9.313	51.68	0 59.08	15 57.09	1 5.24	1 50 59.68
20	1 53 44.29	44.09	11 40 19.1	18.2	9.330	51.21	1 11.93	15 56.83	1 5.30	1 54 56.24
21	1 57 28.41	28.19	+12 0 42.3	41.2	9.348	+50.72	−1 24.36	15 56.58	1 5.36	1 58 52.79
22	2 1 12.97	12.72	12 20 53.6	52.3	9.366	50.22	1 36.36	15 56.33	1 5.43	2 2 49.35
23	2 4 57.97	57.69	12 40 52.8	51.3	9.385	49.71	1 47.92	15 56.08	1 5.50	2 6 45.90
24	2 8 43.42	43.11	13 0 39.4	37.8	9.405	49.17	1 59.02	15 55.83	1 5.57	2 10 42.46
25	2 12 29.34	29.00	13 20 13.1	11.4	9.423	48.63	2 9.65	15 55.58	1 5.64	2 14 39.01
26	2 16 15.73	15.37	+13 39 33.5	31.6	9.443	+48.07	−2 19.80	15 55.34	1 5.71	2 18 35.56
27	2 20 2.61	2.22	13 58 40.4	38.4	9.463	47.50	2 29.48	15 55.10	1 5.78	2 22 32.11
28	2 23 49.97	49.56	14 17 33.4	31.4	9.483	46.91	2 38.68	15 54.86	1 5.86	2 26 28.67
29	2 27 37.83	37.39	14 36 12.2	10.2	9.504	46.32	2 47.38	15 54.62	1 5.94	2 30 25.22
30	2 31 26.20	25.74	14 54 36.6	34.4	9.526	45.71	2 55.56	15 54.39	1 6.02	2 34 21.78
May 1	2 35 15.09	14.61	+15 12 46.1	43.9	9.548	+45.08	−3 3.22	15 54.16	1 6.10	2 38 18.33
2	2 39 4.51	4.01	15 30 40.5	38.2	9.571	44.44	3 10.35	15 53.93	1 6.18	2 42 14.89
3	2 42 54.48	53.96	15 48 19.4	17.1	9.594	43.80	3 16.94	15 53.70	1 6.26	2 46 11.44
4	2 46 45.00	44.46	16 5 42.6	40.3	9.617	43.14	3 22.98	15 53.47	1 6.34	2 50 8.00
5	2 50 36.08	35.52	16 22 49.9	47.5	9.640	42.46	3 28.46	15 53.24	1 6.42	2 54 4.55
6	2 54 27.73	27.15	+16 39 40.9	38.4	9.664	+41.78	−3 33.37	15 53.02	1 6.50	2 58 1.11
7	2 58 19.95	19.36	16 56 15.3	12.8	9.688	41.08	3 37.71	15 52.79	1 6.58	3 1 57.67
8	3 2 12.75	12.15	17 12 33.0	30.4	9.712	40.38	3 41.47	15 52.57	1 6.66	3 5 54.23
9	3 6 6.14	5.53	17 28 33.5	30.9	9.736	39.66	3 44.63	15 52.35	1 6.74	3 9 50.78
10	3 9 60.12	59.50	17 44 16.5	14.0	9.761	38.92	3 47.20	15 52.13	1 6.82	3 13 47.34
11	3 13 54.69	54.07	+17 59 41.9	39.4	9.786	+38.18	−3 49.19	15 51.92	1 6.90	3 17 43.89
12	3 17 49.86	49.23	18 14 49.4	46.9	9.811	37.43	3 50.58	15 51.71	1 6.99	3 21 40.45
13	3 21 45.62	44.99	18 29 38.5	36.1	9.836	36.66	3 51.38	15 51.50	1 7.07	3 25 37.00
14	3 25 41.98	41.34	18 44 9.0	6.7	9.860	35.88	3 51.58	15 51.29	1 7.15	3 29 33.56
15	3 29 38.92	38.28	18 58 20.8	18.5	9.885	35.09	3 51.19	15 51.09	1 7.23	3 33 30.11
16	3 33 36.44	35.80	+19 12 13.4	11.2	9.909	+34.28	−3 50.23	15 50.89	1 7.31	3 37 26.67
17	3 37 34.53	33.90	+19 25 46.6	44.5	9.933	+33.46	−3 48.69	15 50.70	1 7.39	3 41 23.23

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^{s}.18$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
May 17	3 37 34.53	33.90	+19 25 46.6	44.5	9.933	+33.46	−3 48.69	15 50.70	1 7.39	3 41 23.23
18	3 41 33.19	32.56	19 38 60.0	57.9	9.956	32.64	3 46.59	15 50.51	1 7.47	3 45 19.79
19	3 45 32.41	31.78	19 51 53.4	51.4	9.979	31.81	3 43.93	15 50.32	1 7.55	3 49 16.34
20	3 49 32.17	31.55	20 4 26.5	24.6	10.001	30.95	3 40.73	15 50.14	1 7.63	3 53 12.90
21	3 53 32.46	31.85	20 16 39.1	37.2	10.023	30.06	3 37.00	15 49.96	1 7.71	3 57 9.45
22	3 57 33.28	32.68	+20 28 30.8	29.0	10.044	+29.21	−3 32.74	15 49.79	1 7.78	4 1 6.01
23	4 1 34.61	34.02	20 39 61.5	59.8	10.065	28.33	3 27.96	15 49.63	1 7.85	4 5 2.57
24	4 5 36.44	35.87	20 51 10.8	9.2	10.086	27.44	3 22.69	15 49.47	1 7.92	4 8 59.13
25	4 9 38.76	38.20	21 1 58.6	57.1	10.106	26.54	3 16.93	15 49.31	1 7.99	4 12 55.68
26	4 13 41.55	41.01	21 12 24.6	23.2	10.126	25.62	3 10.70	15 49.15	1 8.06	4 16 52.24
27	4 17 44.80	44.28	+21 22 28.6	27.3	10.145	+24.70	−3 4.00	15 49.00	1 8.13	4 20 48.79
28	4 21 48.51	48.01	21 32 10.4	9.2	10.164	23.77	2 56.85	15 48.86	1 8.19	4 24 45.35
29	4 25 52.65	52.17	21 41 29.8	28.7	10.182	22.83	2 49.26	15 48.72	1 8.26	4 28 41.91
30	4 29 57.22	56.76	21 50 26.6	25.6	10.199	21.89	2 41.25	15 48.58	1 8.32	4 32 38.47
31	4 34 2.20	1.76	21 58 60.6	59.7	10.216	20.94	2 32.83	15 48.44	1 8.38	4 36 35.03
June 1	4 38 7.59	7.17	+22 7 11.6	10.8	10.232	+19.98	−2 24.01	15 48.31	1 8.44	4 40 31.59
2	4 42 13.37	12.98	22 14 59.5	58.8	10.248	19.01	2 14.79	15 48.18	1 8.49	4 44 28.14
3	4 46 19.52	19.16	22 22 24.2	23.6	10.264	18.04	2 5.19	15 48.05	1 8.54	4 48 24.70
4	4 50 26.04	25.71	22 29 25.4	24.9	10.279	17.06	1 55.23	15 47.92	1 8.59	4 52 21.25
5	4 54 32.90	32.60	22 36 3.1	2.6	10.293	16.08	1 44.92	15 47.80	1 8.64	4 56 17.81
6	4 58 40.10	39.83	+22 42 17.1	16.7	10.307	+15.09	−1 34.27	15 47.68	1 8.68	5 0 14.37
7	5 2 47.63	47.39	22 48 7.3	7.0	10.320	14.10	1 23.31	15 47.57	1 8.72	5 4 10.93
8	5 6 55.45	55.24	22 53 33.6	33.4	10.332	13.10	1 12.05	15 47.46	1 8.76	5 8 7.49
9	5 11 3.55	3.38	22 58 35.9	35.7	10.343	12.10	1 0.50	15 47.35	1 8.80	5 12 4.05
10	5 15 11.92	11.78	23 3 14.0	13.8	10.354	11.09	0 48.69	15 47.24	1 8.83	5 16 0.60
11	5 19 20.53	20.43	+23 7 27.7	27.6	10.364	+10.08	−0 36.64	15 47.14	1 8.86	5 19 57.16
12	5 23 29.36	29.29	23 11 17.1	17.1	10.373	9.06	0 24.37	15 47.04	1 8.88	5 23 53.72
13	5 27 38.38	38.35	23 14 42.1	42.1	10.380	8.04	−0 11.90	15 46.95	1 8.90	5 27 50.28
14	5 31 47.58	47.59	23 17 42.5	42.5	10.386	7.01	+0 0.74	15 46.86	1 8.92	5 31 46.83
15	5 35 56.92	56.96	23 20 18.3	18.3	10.392	5.98	0 13.52	15 46.78	1 8.94	5 35 43.39
16	5 40 6.37	6.45	+23 22 29.4	29.4	10.396	+ 4.95	+0 26.41	15 46.71	1 8.95	5 39 39.95
17	5 44 15.91	16.03	23 24 15.8	15.8	10.398	3.92	0 39.40	15 46.64	1 8.96	5 43 36.51
18	5 48 25.52	25.67	23 25 37.4	37.4	10.400	2.88	0 52.45	15 46.57	1 8.97	5 47 33.07
19	5 52 35.16	35.35	23 26 34.1	34.1	10.402	1.85	1 5.54	15 46.51	1 8.97	5 51 29.63
20	5 56 44.81	45.04	23 27 6.0	6.0	10.402	+ 0.82	1 18.63	15 46.46	1 8.97	5 55 26.18
21	6 0 54.44	54.71	+23 27 13.1	13.1	10.400	− 0.22	+1 31.70	15 46.41	1 8.97	5 59 22.74
22	6 5 4.02	4.33	23 26 55.4	55.3	10.397	1.25	1 44.73	15 46.37	1 8.97	6 3 19.30
23	6 9 13.54	13.88	23 26 12.8	12.7	10.394	2.29	1 57.69	15 46.33	1 8.96	6 7 15.86
24	6 13 22.95	23.33	23 25 5.4	5.3	10.389	3.32	2 10.55	15 46.30	1 8.95	6 11 12.41
25	6 17 32.23	32.65	23 23 33.3	33.1	10.384	4.35	2 23.28	15 46.27	1 8.94	6 15 8.97
26	6 21 41.37	41.83	+23 21 36.5	36.2	10.377	− 5.38	+2 35.87	15 46.25	1 8.92	6 19 5.53
27	6 25 50.35	50.84	23 19 15.0	14.7	10.369	6.40	2 48.28	15 46.23	1 8.90	6 23 2.09
28	6 29 59.14	59.66	23 16 29.0	28.7	10.361	7.42	3 0.51	15 46.21	1 8.87	6 26 58.65
29	6 34 7.71	8.27	23 13 18.5	18.1	10.352	8.44	3 12.53	15 46.20	1 8.84	6 30 55.21
30	6 38 16.05	16.65	23 9 43.6	43.1	10.342	9.45	3 24.32	15 46.19	1 8.81	6 34 51.76
31	6 42 24.15	24.78	+23 5 44.4	43.8	10.332	−10.46	+3 35.87	15 46.18	1 8.77	6 38 48.32
32	6 46 31.99	32.65	+23 1 21.0	20.3	10.320	−11.47	+3 47.14	15 46.18	1 8.73	6 42 44.88

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0^s.19 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
July 1	6 42 24.15	24.78	+23 5 44.4	43.8	10.332	−10.46	+3 35.87	15 46.18	1 8.77	6 38 48.32
2	6 46 31.99	32.65	23 1 21.0	20.3	10.320	11.47	3 47.14	15 46.18	1 8.73	6 42 44.88
3	6 50 39.55	40.24	22 56 33.5	32.7	10.308	12.47	3 58.14	15 46.18	1 8.69	6 46 41.44
4	6 54 46.80	47.52	22 51 22.1	21.2	10.295	13.47	4 8.84	15 46.18	1 8.65	6 50 37.99
5	6 58 53.75	54.50	22 45 46.9	45.8	10.282	14.46	4 19.22	15 46.19	1 8.60	6 54 34.55
6	7 3 0.37	1.14	+22 39 47.9	46.8	10.268	−15.44	+4 29.28	15 46.20	1 8.55	6 58 31.11
7	7 7 6.64	7.43	22 33 25.4	24.2	10.254	16.42	4 39.00	15 46.21	1 8.50	7 2 27.67
8	7 11 12.55	13.37	22 26 39.5	38.2	10.239	17.40	4 48.35	15 46.23	1 8.45	7 6 24.23
9	7 15 18.08	18.92	22 19 30.3	28.9	10.222	18.37	4 57.32	15 46.25	1 8.39	7 10 20.79
10	7 19 23.21	24.07	22 11 58.0	56.4	10.205	19.32	5 5.90	15 46.28	1 8.33	7 14 17.34
11	7 23 27.93	28.81	+22 4 2.7	1.0	10.188	−20.27	+5 14.07	15 46.31	1 8.27	7 18 13.90
12	7 27 32.23	33.13	21 55 44.7	42.8	10.170	21.22	5 21.80	15 46.35	1 8.21	7 22 10.46
13	7 31 36.08	37.00	21 47 4.1	2.1	10.151	22.16	5 29.09	15 46.39	1 8.14	7 26 7.02
14	7 35 39.47	40.41	21 37 61.1	59.0	10.131	23.09	5 35.92	15 46.43	1 8.07	7 30 3.57
15	7 39 42.37	43.33	21 28 36.0	33.7	10.111	24.00	5 42.27	15 46.48	1 8.00	7 34 0.13
16	7 43 44.77	45.74	+21 18 48.8	46.3	10.089	−24.91	+5 48.12	15 46.54	1 7.93	7 37 56.68
17	7 47 46.66	47.64	21 8 39.9	37.3	10.067	25.82	5 53.44	15 46.60	1 7.86	7 41 53.24
18	7 51 48.02	49.01	20 58 9.5	6.8	10.045	26.71	5 58.24	15 46.67	1 7.78	7 45 49.79
19	7 55 48.83	49.83	20 47 17.9	15.1	10.022	27.59	6 2.49	15 46.75	1 7.70	7 49 46.35
20	7 59 49.09	50.10	20 36 5.1	2.2	9.999	28.46	6 6.19	15 46.83	1 7.62	7 53 42.91
21	8 3 48.78	49.80	+20 24 31.5	28.5	9.975	−29.32	+6 9.32	15 46.91	1 7.54	7 57 39.47
22	8 7 47.88	48.91	20 12 37.4	34.3	9.951	30.17	6 11.86	15 47.00	1 7.46	8 1 36.03
23	8 11 46.39	47.42	20 0 23.0	19.8	9.926	31.02	6 13.81	15 47.09	1 7.38	8 5 32.59
24	8 15 44.30	45.33	19 47 48.7	45.4	9.901	31.85	6 15.16	15 47.19	1 7.30	8 9 29.14
25	8 19 41.60	42.63	19 34 54.6	51.2	9.876	32.66	6 15.91	15 47.29	1 7.31	8 13 25.70
26	8 23 38.29	39.32	+19 21 41.0	37.5	9.851	−33.46	+6 16.04	15 47.40	1 7.13	8 17 22.25
27	8 27 34.37	35.40	19 8 8.2	4.6	9.825	34.26	6 15.55	15 47.51	1 7.04	8 21 18.81
28	8 31 29.83	30.86	18 54 16.5	12.8	9.800	35.04	6 14.46	15 47.62	1 6.96	8 25 15.37
29	8 35 24.68	25.70	18 40 6.3	2.5	9.774	35.81	6 12.76	15 47.74	1 6.87	8 29 11.93
30	8 39 18.92	19.93	18 25 37.7	33.9	9.749	36.57	6 10.44	15 47.86	1 6.79	8 33 8.48
31	8 43 12.55	13.55	+18 10 50.9	47.1	9.723	−37.32	+6 7.51	15 47.98	1 6.70	8 37 5.04
Aug. 1	8 47 5.58	6.57	17 55 46.3	42.4	9.697	38.06	6 3.98	15 48.11	1 6.62	8 41 1.59
2	8 50 58.01	58.99	17 40 24.2	20.3	9.672	38.78	5 59.85	15 48.24	1 6.53	8 44 58.15
3	8 54 49.84	50.80	17 24 44.8	40.9	9.647	39.49	5 55.12	15 48.37	1 6.44	8 48 54.70
4	8 58 41.08	42.02	17 8 48.4	44.5	9.623	40.20	5 49.80	15 48.50	1 6.35	8 52 51.26
5	9 2 31.73	32.65	+16 52 35.4	31.5	9.599	−40.89	+5 43.90	15 48.63	1 6.27	8 56 47.81
6	9 6 21.81	22.71	16 36 6.0	2.1	9.575	41.56	5 37.42	15 48.77	1 6.18	9 0 44.37
7	9 10 11.31	12.19	16 19 20.4	16.5	9.551	42.23	5 30.36	15 48.91	1 6.10	9 4 40.93
8	9 14 0.24	1.10	16 2 18.9	15.1	9.527	42.88	5 22.73	15 49.06	1 6.01	9 8 37.49
9	9 17 48.61	49.45	15 44 61.9	58.1	9.504	43.52	5 14.54	15 49.21	1 5.93	9 12 34.04
10	9 21 36.42	37.24	+15 27 29.7	26.0	9.481	−44.15	+5 5.80	15 49.37	1 5.84	9 16 30.60
11	9 25 23.68	24.47	15 9 42.5	38.9	9.458	44.77	4 56.50	15 49.53	1 5.75	9 20 27.15
12	9 29 10.40	11.15	14 51 40.7	37.1	9.435	45.38	4 46.66	15 49.70	1 5.67	9 24 23.71
13	9 32 56.57	57.29	14 33 24.5	21.0	9.412	45.96	4 36.28	15 49.87	1 5.59	9 28 20.26
14	9 36 42.20	42.89	14 14 54.4	51.0	9.390	46.54	4 25.36	15 50.04	1 5.51	9 32 16.82
15	9 40 27.30	27.96	+13 56 10.6	7.3	9.368	−47.10	+4 13.90	15 50.21	1 5.43	9 36 13.37
16	9 44 11.87	12.50	+13 37 13.4	10.2	9.346	−47.66	+4 1.92	15 50.39	1 5.36	9 40 9.93

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^s.18$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Aug. 16	9 44 11.87	12.50	+13 37 13.4	10.2	9.346	−47.66	+ 4 1.92	15 50.39	1 5.36	9 40 9.93
17	9 47 55.92	56 52	13 18 3.2	0.1	9.325	48.19	3 49.41	15 50.58	1 5.28	9 44 6.48
18	9 51 39.46	40.02	12 58 40.3	37.4	9.304	48.71	3 36.39	15 50.77	1 5.22	9 48 3.04
19	9 55 22.49	23.01	12 39 5.1	2.3	9.283	49.21	3 22.87	15 50.97	1 5.15	9 51 59.59
20	9 59 5.02	5.51	12 19 17.9	15.3	9.262	49.70	3 8.86	15 51.17	1 5.08	9 55 56.14
21	10 2 47.07	47.52	+11 59 19.1	16.6	9.242	−50.18	+ 2 54.36	15 51.37	1 5.01	9 59 52.69
22	10 6 28.64	29.05	11 39 8.9	6.6	9.223	50.65	2 39.37	15 51.58	1 4.95	10 3 49.25
23	10 10 9.75	10.12	11 18 47.7	45.6	9.204	51.10	2 23.92	15 51.79	1 4.88	10 7 45.80
24	10 13 50.42	50.75	10 58 15.8	13.9	9.185	51.54	2 8.04	15 52.00	1 4.82	10 11 42.36
25	10 17 30.66	30.95	10 37 33.6	31.9	9.167	51.97	1 51.72	15 52.22	1 4.76	10 15 38.91
26	10 21 10.47	10.72	+10 16 41.4	39.9	9.151	−52.38	+ 1 34.98	15 52.44	1 4.70	10 19 35.47
27	10 24 49.89	50.09	9 55 39.4	38.2	9.135	52.77	1 17.85	15 52.66	1 4.64	10 23 32.02
28	10 28 28.92	29.08	9 34 28.0	27.0	9.119	53.16	1 0.33	15 52.88	1 4.59	10 27 28.58
29	10 32 7.60	7.71	9 13 7.5	6.7	9.104	53.54	0 42.46	15 53.10	1 4.54	10 31 25.13
30	10 35 45.93	45.99	8 51 38.2	37.7	9.090	53.90	0 24.25	15 53.33	1 4.49	10 35 21.68
31	10 39 23.94	23.95	+ 8 30 0.5	0.3	9.077	−54.24	+ 0 5.71	15 53.55	1 4.44	10 39 18.23
Sept. 1	10 43 1.64	1.61	8 8 14.6	14.7	9.066	54.58	− 0 13.14	15 53.78	1 4.39	10 43 14.79
2	10 46 39.07	38.99	7 46 20.7	21.2	9.055	54.91	0 32.27	15 54.01	1 4.35	10 47 11.34
3	10 50 16.24	16.11	7 24 19.3	20.1	9.044	55.22	0 51.65	15 54.24	1 4.31	10 51 7.90
4	10 53 53.17	52.99	7 2 10.6	11.7	9.034	55.51	1 11.28	15 54.47	1 4.27	10 55 4.45
5	10 57 29.87	29.64	+ 6 39 54.9	56.3	9.025	−55.80	− 1 31.12	15 54.71	1 4.24	10 59 1.01
6	11 1 6.37	6.09	6 17 32.5	34.2	9.017	56 07	1 51.16	15 54.94	1 4.21	11 2 57.56
7	11 4 42.69	42.36	5 55 3.8	5.8	9.010	56.33	2 11.38	15 55.18	1 4.18	11 6 54.11
8	11 8 18.85	18.47	5 32 29.1	31.4	9.003	56.58	2 31.78	15 55.42	1 4.16	11 10 50.66
9	11 11 54.86	54.43	5 9 48.6	51.3	8.997	56.80	2 52.32	15 55.66	1 4.14	11 14 47.22
10	11 15 30.73	30.25	+ 4 47 2.7	5.8	8.992	−57.01	− 3 12.99	15 55.91	1 4.12	11 18 43.77
11	11 19 6.49	5.96	4 24 11.9	15.3	8.987	57.21	3 33.79	15 56.16	1 4.10	11 22 40.33
12	11 22 42.15	41.57	4 1 16.3	20.1	8.983	57.40	3 54.68	15 56.41	1 4.08	11 26 36.88
13	11 26 17.72	17.09	3 38 16.4	20.5	8.981	57.58	4 15.65	15 56.67	1 4.07	11 30 33.43
14	11 29 53.23	52.54	3 15 12.5	16.9	8.979	57.74	4 36.68	15 56.93	1 4.06	11 34 29.98
15	11 33 28.69	27.95	+ 2 52 4.8	9.6	8.977	−57.89	− 4 57.77	15 57.19	1 4.05	11 38 26.54
16	11 37 4.12	3.33	2 28 53.9	59.0	8.976	58.01	5 18.89	15 57.45	1 4.05	11 42 23.09
17	11 40 39.53	38.68	2 5 40.1	45.6	8.975	58.12	5 40.04	15 57.72	1 4.05	11 46 19.65
18	11 44 14.94	14.04	1 42 23.8	29.6	8.976	58.22	6 1.18	15 57.99	1 4.05	11 50 16.20
19	11 47 50.37	49.42	1 19 5.2	11.4	8.977	58.30	6 22.29	15 58.26	1 4.06	11 54 12.75
20	11 51 25.83	24.83	+ 0 55 44.8	51.4	8.979	−58.37	− 6 43.37	15 58.53	1 4.07	11 58 9.30
21	11 55 1.35	0.29	0 32 23.0	29.9	8.982	58.43	7 4.40	15 58.80	1 4.08	12 2 5.85
22	11 58 36.94	35.83	+ 0 9 0.0	7.3	8.985	58.48	7 25.36	15 59.07	1 4.10	12 6 2.40
23	12 2 12.63	11.47	− 0 14 23.7	16.1	8.989	58.50	7 46.22	15 59.35	1 4.12	12 9 58.96
24	12 5 48.45	47.23	0 37 48.0	40.0	8.995	58.52	8 6.96	15 59.62	1 4.14	12 13 55.51
25	12 9 24.40	23.13	− 1 1 12.4	4.1	9.001	−58.52	− 8 27.55	15 59.90	1 4.16	12 17 52.07
26	12 12 60.51	59.19	1 24 36.5	27.9	9.009	58.50	8 47.98	16 0.17	1 4.19	12 21 48.62
27	12 16 36.81	35.44	1 47 60.2	51.2	9.017	58.47	9 8.23	16 0.45	1 4.22	12 25 45.17
28	12 20 13.33	11.90	2 11 23.0	13.7	9.026	58.43	9 28.27	16 0.72	1 4.25	12 29 41.72
29	12 23 50.08	48.60	2 34 44.6	35.0	9.037	58.37	9 48.07	16 1.00	1 4.29	12 33 38.28
30	12 27 27.09	25.56	− 2 57 64.6	54.7	9.049	−58.29	−10 7.62	16 1.27	1 4.33	12 37 34.83
31	12 31 4.38	2.80	− 3 21 22.8	12.6	9.061	−58.21	−10 26.88	16 1.55	1 4.37	12 41 31.39

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^{s}.18$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Oct. 1	12 31 4.38	2.80	− 3 21 22.8	12.6	9.061	−58.21	−10 26.88	16 1.55	1 4.37	12 41 31.39
2	12 34 41.99	40.35	3 44 38.9	28.4	9.074	58.11	10 45.82	16 1.82	1 4.42	12 45 27.94
3	12 38 19.92	18.24	4 7 52.5	41.7	9.088	58.00	11 4.43	16 2.10	1 4.47	12 49 24.49
4	12 41 58.21	56.48	4 30 63.2	52.1	9.103	57.88	11 22.69	16 2.37	1 4.52	12 53 21.04
5	12 45 36.87	35.09	4 53 70.8	59.5	9.120	57.74	11 40.58	16 2.65	1 4.57	12 57 17.60
6	12 49 15.93	14.10	− 5 17 14.8	3.4	9.137	−57.58	−11 58.08	16 2.92	1 4.63	13 1 14.15
7	12 52 55.40	53.53	5 40 14.9	3.2	9.154	57.41	12 15.16	16 3.19	1 4.69	13 5 10.71
8	12 56 35.31	33.39	6 2 70.8	58.9	9.173	57.23	12 31.80	16 3.46	1 4.75	13 9 7.26
9	13 0 15.67	13.71	6 25 62.0	49.9	9.192	57.04	12 47.97	16 3.74	1 4.82	13 13 3.81
10	13 3 56.50	54.50	6 48 48.2	35.9	9.212	56.83	13 3.71	16 4.01	1 4.89	13 17 0.36
11	13 7 37.82	35.77	− 7 11 29.0	16.5	9.232	−56.59	−13 18.96	16 4.28	1 4.96	13 20 56.92
12	13 11 19.64	17.54	7 33 64.0	51.3	9.253	56.33	13 33.69	16 4.55	1 5.03	13 24 53.47
13	13 14 61.98	59.83	7 56 32.9	20.0	9.275	56.07	13 47.91	16 4.83	1 5.11	13 28 50.03
14	13 18 44.84	42.66	8 18 55.2	42.2	9.297	55.79	14 1.60	16 5.10	1 5.19	13 32 46.58
15	13 22 28.25	26.03	8 40 70.4	57.3	9.320	55.49	14 14.75	16 5.38	1 5.27	13 36 43.13
16	13 26 12.23	9.97	− 9 3 18.2	4.9	9.344	−55.16	−14 27.33	16 5.65	1 5.35	13 40 39.68
17	13 29 56.78	54.48	9 25 18.2	4.8	9.368	54.82	14 39.33	16 5.93	1 5.44	13 44 36.24
18	13 33 41.91	39.58	9 46 69.9	56.4	9.394	54.47	14 50.75	16 6.20	1 5.53	13 48 32.79
19	13 37 27.65	25.28	10 8 53.0	39.4	9.420	54.10	15 1.57	16 6.48	1 5.62	13 52 29.35
20	13 41 14.02	11.61	10 30 27.0	13.3	9.446	53.72	15 11.77	16 6.75	1 5.72	13 56 25.90
21	13 44 61.02	58.58	−10 51 51.5	37.8	9.472	−53.32	−15 21.34	16 7.03	1 5.82	14 0 22.46
22	13 48 48.66	46.19	11 12 66.2	52.5	9.499	52.90	15 30.25	16 7.30	1 5.92	14 4 19.01
23	13 52 36.96	34.46	11 33 70.7	57.0	9.527	52.46	15 38.50	16 7.58	1 6.02	14 8 15.56
24	13 56 25.95	23.43	11 54 64.5	50.8	9.556	52.01	15 46.08	16 7.85	1 6.12	14 12 12.11
25	14 0 15.64	13.10	12 15 47.3	33.6	9.585	51.55	15 52.96	16 8.12	1 6.23	14 16 8.67
26	14 4 6.04	3.48	−12 36 18.8	5.1	9.616	−51.06	−15 59.12	16 8.38	1 6.33	14 20 5.23
27	14 7 57.18	54.59	12 56 38.4	24.8	9.647	50.56	16 4.55	16 8.64	1 6.44	14 24 1.78
28	14 11 49.06	46.45	13 16 45.9	32.4	9.678	50.05	16 9.23	16 8.90	1 6.55	14 27 58.33
29	14 15 41.70	39.07	13 36 40.8	27.4	9.710	49.52	16 13.15	16 9.15	1 6.66	14 31 54.89
30	14 19 35.12	32.47	13 56 22.8	9.5	9.743	48.97	16 16.29	16 9.40	1 6.77	14 35 51.44
31	14 23 29.33	26.67	−14 15 51.6	38.4	9.776	−48.41	−16 18.65	16 9.64	1 6.88	14 39 48.00
Nov. 1	14 27 24.35	21.68	14 34 66.6	53.6	9.810	47.83	16 20.20	16 9.88	1 6.99	14 43 44.55
2	14 31 20.18	17.50	14 53 67.6	54.7	9.844	47.24	16 20.93	16 10.12	1 7.11	14 47 41.11
3	14 35 16.84	14.15	15 12 54.1	41.3	9.878	46.63	16 20.83	16 10.36	1 7.22	14 51 37.66
4	14 39 14.34	11.64	15 31 25.8	13.2	9.913	46.00	16 19.90	16 10.60	1 7.34	14 55 34.22
5	14 43 12.68	9.97	−15 49 42.3	29.9	9.948	−45.36	−16 18.13	16 10.84	1 7.46	14 59 30.77
6	14 47 11.87	9.16	16 7 43.1	30.9	9.984	44.69	16 15.50	16 11.07	1 7.58	15 3 27.33
7	14 51 11.92	9.21	16 25 27.7	15.7	10.020	44.01	16 12.01	16 11.30	1 7.70	15 7 23.88
8	14 55 12.83	10.12	16 42 55.8	44.1	10.056	43.32	16 7.67	16 11.53	1 7.82	15 11 20.44
9	14 59 14.60	11.89	16 59 67.1	55.6	10.092	42.61	16 2.46	16 11.76	1 7.94	15 15 16.99
10	15 3 17.22	14.52	−17 16 61.1	49.9	10.128	−41.87	−15 56.40	16 11.98	1 8.06	15 19 13.55
11	15 7 20.70	18.01	17 33 37.3	26.4	10.164	41.12	15 49.49	16 12.21	1 8.18	15 23 10.11
12	15 11 25.03	22.35	17 49 55.2	44.6	10.199	40.35	15 41.73	16 12.43	1 8.30	15 27 6.67
13	15 15 30.21	27.55	18 5 54.5	44.2	10.234	39.57	15 33.11	16 12.64	1 8.42	15 31 3.22
14	15 19 36.24	33.60	18 21 34.8	24.8	10.269	38.77	15 23.65	16 12.85	1 8.54	15 34 59.78
15	15 23 43.10	40.48	−18 36 55.7	46.0	10.303	−37.95	−15 13.35	16 13.07	1 8.65	15 38 56.33
16	15 27 50.79	48.20	−18 51 56.8	47.4	10.337	−37.12	−15 2.22	16 13.28	1 8.76	15 42 52.89

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0ˢ.18 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Decli-nation.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Nov.16	15 27 50.79	48.20	−18 51 56.8	47.4	10.337	−37.12	−15 2.22	16 13.28	1 8.76	15 42 52.89
17	15 31 59.30	56.74	19 6 37.6	28.6	10.371	36.27	14 50.27	16 13.49	1 8.88	15 46 49.44
18	15 36 8.62	6.09	19 20 57.8	49.2	10.405	35.40	14 37.51	16 13.70	1 8.99	15 50 46.00
19	15 40 18.75	16.25	19 34 56.9	48.7	10.439	34.52	14 23.95	16 13.91	1 9.11	15 54 42.56
20	15 44 29.68	27.21	19 48 34.7	26.8	10.472	33.62	14 9.58	16 14.11	1 9.22	15 58 39.12
21	15 48 41.40	38.97	−20 1 50.7	43.1	10.505	−32.70	−13 54.42	16 14.31	1 9.33	16 2 35.67
22	15 52 53.90	51.51	20 14 44.7	37.4	10.537	31.78	13 38.50	16 14.50	1 9.44	16 6 32.23
23	15 57 7.16	4.81	20 27 16.2	9.3	10.569	30.84	13 21.80	16 14.69	1 9.55	16 10 28.79
24	16 1 21.18	18.88	20 39 24.9	18.4	10.601	29.88	13 4.33	16 14.88	1 9.66	16 14 25.35
25	16 5 35.96	33.70	20 51 10.6	4.4	10.631	28.92	12 46.11	16 15.06	1 9.76	16 18 21.90
26	16 9 51.48	49.27	−21 2 32.8	27.0	10.661	−27.94	−12 27.14	16 15.24	1 9.86	16 22 18.46
27	16 14 7.72	5.56	21 13 31.3	25.9	10.691	26.95	12 7.45	16 15.40	1 9.96	16 26 15.01
28	16 18 24.68	22.57	21 24 5.9	0.8	10.721	25.94	11 47.06	16 15.56	1 10.06	16 30 11.57
29	16 22 42.34	40.29	21 34 16.1	11.3	10.750	24.91	11 25.97	16 15.72	1 10.16	16 34 8.13
30	16 26 60.68	58.69	21 43 61.7	57.3	10.778	23.88	11 4.18	16 15.87	1 10.25	16 38 4.69
Dec. 1	16 31 19.70	17.77	−21 53 22.5	18.4	10.806	−22.84	−10 41.72	16 16.02	1 10.34	16 42 1.25
2	16 35 39.37	37.50	22 2 18.2	14.4	10.833	21.79	10 18.61	16 16.16	1 10.42	16 45 57.81
3	16 39 59.66	57.86	22 10 48.4	45.0	10.858	20.73	9 54.87	16 16.30	1 10.50	16 49 54.36
4	16 44 20.57	18.84	22 18 52.9	49.8	10.883	19.65	9 30.52	16 16.43	1 10.58	16 53 50.92
5	16 48 42.06	40.40	22 26 31.4	28.6	10.907	18.56	9 5.58	16 16.56	1 10.65	16 57 47.47
6	16 53 4.11	2.53	−22 33 43.7	41.2	10.929	−17.47	− 8 40.08	16 16.69	1 10.72	17 1 44.03
7	16 57 26.69	25.19	22 40 29.7	27.4	10.950	16.36	8 14.05	16 16.81	1 10.79	17 5 40.59
8	17 1 49.78	48.36	22 46 49.0	47.0	10.971	15.94	7 47.52	16 16.92	1 10.85	17 9 37.15
9	17 6 13.34	12.00	22 52 41.5	39.7	10.990	14.12	7 20.52	16 17.03	1 10.91	17 13 33.71
10	17 10 37.32	36.06	22 58 6.9	5.3	11.007	12.99	6 53.09	16 17.14	1 10.97	17 17 30.27
11	17 15 1.70	0.53	−23 3 4.9	3.5	11.023	−11.85	− 6 25.25	16 17.25	1 11.02	17 21 26.83
12	17 19 26.46	25.37	23 7 35.5	34.3	11.038	10.70	5 57.04	16 17.35	1 11.07	17 25 23.39
13	17 23 51.55	50.54	23 11 38.5	37.5	11.051	9.55	5 28.50	16 17.45	1 11.12	17 29 19.94
14	17 28 16.94	16.02	23 15 13.7	12.9	11.063	8.40	4 59.66	16 17.55	1 11.16	17 33 16.50
15	17 32 42.59	41.76	23 18 21.0	20.4	11.073	7.23	4 30.57	16 17.64	1 11.19	17 37 13.06
16	17 37 8.46	7.72	−23 21 0.4	0.0	11.081	− 6.06	− 4 1.25	16 17.73	1 11.22	17 41 9.62
17	17 41 34.52	33.86	23 23 11.7	11.4	11.088	4.89	3 31.74	16 17.82	1 11.24	17 45 6.18
18	17 46 0.72	0.16	23 24 54.8	54.6	11.095	3.71	3 2.07	16 17.90	1 11.26	17 49 2.74
19	17 50 27.04	26.58	23 26 9.6	9.5	11.099	2.53	2 32.29	16 17.97	1 11.28	17 52 59.29
20	17 54 53.45	53.08	23 26 56.2	56.1	11.101	1.35	2 2.43	16 18.04	1 11.29	17 56 55.85
21	17 59 19.92	19.63	−23 27 14.6	14.5	11.102	− 0.17	− 1 32.52	16 18.10	1 11.30	18 0 52.41
22	18 3 46.40	46.20	23 27 4.6	4.6	11.103	+ 1.00	1 2.60	16 18.16	1 11.30	18 4 48.97
23	18 8 12.85	12.74	23 26 26.3	26.3	11.102	2.18	0 32.70	16 18.21	1 11.30	18 8 45.53
24	18 12 39.26	39.24	23 25 19.8	19.8	11.099	3.36	− 0 2.84	16 18.26	1 11.29	18 12 42.09
25	18 17 5.60	5.68	23 23 45.0	45.0	11.095	4.54	+ 0 26.96	16 18.30	1 11.28	18 16 38.64
26	18 21 31.84	32.01	−23 21 42.0	41.9	11.091	+ 5.71	+ 0 56.66	16 18.34	1 11.27	18 20 35.20
27	18 25 57.94	58.20	23 19 10.9	10.7	11.085	6.88	1 26.22	16 18.36	1 11.25	18 24 31.76
28	18 30 23.87	24.22	23 16 11.7	11.4	11.077	8.05	1 55.60	16 18.38	1 11.22	18 28 28.32
29	18 34 49.61	50.05	23 12 44.5	44.1	11.068	9.21	2 24.79	16 18.40	1 11.19	18 32 24.88
30	18 39 15.13	15.66	23 8 49.5	49.0	11.058	10.37	2 53.76	16 18.41	1 11.16	18 36 21.44
31	18 43 40.40	41.02	−23 4 26.8	26.2	11.046	+11.52	+ 3 22.48	16 18.41	1 11.12	18 40 17.99
32	18 48 5.38	6.09	−22 59 36.5	35.7	11.034	+12.67	+ 3 50.91	16 18.41	1 11.08	18 44 14.55

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0ˢ.19 from the sidereal interval.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Jan. 1	8 53.21	1.907	3 39 52.04	124.57	+16 18 39.0	+565.0	64.52	14 57.8	54 48.3	I. S.
2	9 39.66	1.964	4 30 23.27	128.06	19 39 41.8	436.1	65.39	14 52.1	54 26.4	I. S.
3	10 27.51	2.020	5 22 18.44	131.39	22 4 57.0	286.4	66.19	14 47.7	54 11.0	I. S.
4	11 16.47	2.051	6 15 20.68	133.46	23 26 49.0	+120.8	66.70	14 45.1	54 1.4	I. S.
5	12 5.90	2.058	7 8 51.57	133.66	23 40 41.2	− 52.0	66.73	14 44.0	53 57.4	I. N.
6	12 55.01	2.026	8 2 2.52	131.84	+22 46 0.5	−220.0	66.27	14 44.3	53 58.5	II. N. S.
7	13 43.06	1.973	8 54 9.78	128.53	20 46 28.4	−374.4	65.43	14 46.1	54 5.5	II. S.
8	14 29.62	1.907	9 44 47.46	124.59	17 49 8.3	−508.2	64.46	14 49.8	54 18.5	II. S.
9	15 14.65	1.846	10 33 53.54	121.07	14 3 3.7	−618.0	63.59	14 55.2	54 38.4	II. S.
10	15 58.51	1.811	11 21 48.67	119.46	9 38 2.1	−703.1	63.03	15 2.4	55 5.1	II. S.
11	16 41.84	1.806	12 9 12.24	119.19	+ 4 43 59.6	−763.1	62.98	15 12.0	55 40.3	II. S.
12	17 25 53	1.842	12 56 57.59	120.71	− 0 28 49.6	−796.6	63.64	15 23.8	56 23.2	II. S.
13	18 10.65	1.936	13 46 8.78	125.94	5 49 3.6	−799.1	65.00	15 37.3	57 13.3	II. S.
14	18 58.37	2.060	14 37 56.55	133.79	11 2 46.2	−762.2	67.09	15 52.5	58 8.8	II. S.
15	19 49.86	2.238	15 33 30.76	144.53	15 51 49.5	−672.9	69.77	16 8.1	59 6.2	II. S.
16	20 45.98	2.440	16 33 43.43	156.46	−19 52 46.5	−519.7	72.70	16 22.9	60 0.6	II. S.
17	21 46.80	2.620	17 38 39.53	167.29	22 38 47.5	−298.4	75.20	16 35.2	60 45.9	II. S.
18	22 51.13	2.720	18 47 6.32	173.49	23 44 4.4	− 21.8	76.56	16 43.1	61 15.0	II. N.
19	23 56.45	2.700	19 56 33.02	172.29	22 54 44.2	+266.3	76.28	16 45.8	61 24.6	II. N.
21	0 59.90	2.572	21 4 7.06	164.59	20 15 24.3	519.3	74.47	16 42.2	61 11.4	I. N.
22	1 59 46	2.388	22 7 47.06	153.54	−16 7 52.9	+704.1	71.84	16 33.0	60 37.8	I. S.
23	2 54.51	2.204	23 6 55.49	142.47	11 2 4.9	811.9	69.13	16 19.1	59 48.6	I. S.
24	3 45.52	2.054	0 2 0.63	133.47	− 5 27 8.8	852.4	66.95	16 3.9	58 51.0	I. S.
25	4 33.50	1.952	0 54 3.84	127.33	+ 0 13 3.7	841.2	65.39	15 47.5	57 50.5	I. S.
26	5 19.61	1.898	1 44 15.00	124.08	5 40 32.4	790.9	64.56	15 31.7	56 52.6	I. S.
27	6 4.96	1.887	2 33 39.67	123.37	+10 41 47.2	+711.1	64.39	15 17.7	56 1.2	I. S.
28	6 50.44	1.908	3 23 12.64	124.66	15 6 6.4	606.8	64.76	15 6.0	55 18.1	I. S.
29	7 36.72	1.951	4 13 33.60	127.23	18 44 17.9	480.6	65.36	14 56.9	54 44.7	I. S.
30	8 24.14	2.000	5 5 3.28	130.20	21 28 3.2	334.9	66.09	14 50.4	54 20.9	I. S.
31	9 12.67	2.039	5 57 39.33	132.60	23 10 12.6	173.4	66.62	14 46.4	54 6.2	I. S.
Feb. 1	10 1.89	2.059	6 50 57.28	133.58	+23 45 37.0	+ 3.1	66.82	14 44.6	53 59.6	I. N.
2	10 51.14	2.044	7 44 16.67	132.69	23 12 15.9	−167.3	66.54	14 44.8	54 0.0	I. N.
3	11 39.68	1.994	8 36 54.05	130.20	21 32 1.5	−329.1	65.83	14 46.6	54 6.7	I. N.
4	12 27.00	1.935	9 28 15.72	126.56	18 50 30.8	−473.6	64.87	14 49.7	54 18.5	II. N.
5	13 12.77	1.879	10 18 7.73	122.79	15 16 14.9	−593.3	63.91	14 54.3	54 35.1	II. S.
6	13 57.21	1.832	11 6 38.09	119.88	+10 59 25.8	−686.0	63.16	15 0.0	54 56.1	II. S.
7	14 40.75	1.804	11 54 14.19	118.42	6 11 6.3	−751.1	62.68	15 7.0	55 21.7	II. S.
8	15 24.10	1.813	12 41 38.55	119.02	+ 1 2 24.5	−787.3	63.04	15 15.2	55 52.2	II. S.
9	16 8.14	1.860	13 29 45.03	121.87	− 4 14 35.5	−792.5	63.92	15 24.9	56 27.5	II. S.
10	16 53.87	1.958	14 19 35.09	127.67	9 26 52.6	−762.7	65.48	15 35.8	57 7.6	II. S.
11	17 42.47	2.098	15 12 13.29	136.09	−14 19 6.8	−690.6	67.67	15 47.8	57 51.9	II. S.
12	18 34.77	2.267	16 8 36.69	146.27	18 32 34.8	−567.3	70.28	16 0.6	58 37.6	II. S.
13	19 31.35	2.446	17 9 17.19	157.02	21 45 11.3	−385.3	72.88	16 13.1	59 24.6	II. S.
14	20 31.88	2.584	18 13 55.64	165.52	23 33 39.4	−147.9	74.87	16 24.3	60 5.7	II. N.
15	21 34.82	2.643	19 21 4.90	169.08	−23 39 14.5	+123.6	75.69	16 32.6	60 36.8	II. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Feb. 15	21 34.82	2.643	19 21 4.90	169.08	−23 39 14.5	+123.6	75.69	16 32.6	60 36.8	II. N.
16	22 38.15	2.606	20 28 25.59	166.49	21 55 9.9	392.2	74.97	16 37.2	60 53.3	II. N.
17	23 39.31	2.479	21 33 39.86	158.66	18 30 48.9	618.5	73.18	16 36.6	60 51.0	II. N.
19	0 36.93	2.393	22 35 24.67	149.42	13 48 57.4	777.3	70.86	16 31.0	60 29.9	I. N.
20	1 30.82	2.174	23 33 23.86	140.88	8 18 27.5	869.5	68.65	16 20.6	59 52.2	I. S.
21	2 21.51	2.059	0 28 10.32	134.10	− 2 27 28.0	+883.9	66.92	16 7.0	59 2.2	I. S.
22	3 9.93	1.984	1 20 39.80	129.23	+ 3 20 15.2	848.8	65.82	15 51.6	58 6.7	I. S.
23	3 57.07	1.950	2 11 52.60	127.23	8 46 8.1	773.3	65.36	15 36.0	57 8.5	I. S.
24	4 43.84	1.952	3 2 42.97	127.27	13 36 5.9	670.7	65.44	15 21.5	56 15.0	I. S.
25	5 30.93	1.974	3 53 52.85	128.74	17 39 17.0	541.9	65.84	15 8.7	55 28.8	I. S.
26	6 18.77	2.007	4 45 47.57	130.86	+20 47 3.2	+394.1	66.42	14 58.9	54 52.2	I. S.
27	7 7.45	2.040	5 38 32.74	132.78	22 52 36.0	231.3	66.89	14 51.6	54 25.2	I. S.
28	7 56.72	2.058	6 31 53.68	133.70	23 56 7.1	+ 58.5	67.10	14 47.6	54 10.5	I. N.
Mar. 1	8 46.07	2.049	7 25 19.80	133.16	23 40 24.5	−114.6	66.90	14 46.3	54 5.7	I. N.
2	9 34.92	2.013	8 18 14.50	131.15	22 21 25.9	−279.6	66.29	14 47.2	54 9.4	I. N.
3	10 22.71	1.961	9 10 6.33	128.06	+19 58 23.8	−432.2	65.40	14 50.4	54 21.0	I. N.
4	11 9.17	1.908	10 0 38.66	124.66	16 38 24.6	−563.8	64.44	14 55.3	54 39.0	I. N.
5	11 54.36	1.862	10 49 53.57	121.73	12 30 43.5	−670.1	63.64	15 1.5	55 1.7	I. N.
6	12 38.58	1.830	11 38 11.11	119.98	7 46 6.7	−746.0	63.17	15 8.6	55 27.6	II. N.
7	13 22.44	1.825	12 26 6.04	119.93	+ 2 36 25.8	−795.1	63.19	15 16.3	55 55.9	II. S.
8	14 6.67	1.862	13 14 24.02	121.96	− 2 45 27.1	−806.5	63.78	15 24.3	56 25.5	II. S.
9	14 52.17	1.935	14 3 58.00	126.29	8 5 25.0	−784.7	65.02	15 32.7	56 56.2	II. S.
10	15 39.86	2.044	14 55 43.60	132.91	13 7 40.8	−719.1	66.81	15 41.3	57 27.7	II. S.
11	16 30.57	2.186	15 50 31.31	141.36	17 34 23.3	−605.8	69.04	15 50.0	57 59.8	II. S.
12	17 24.85	2.340	16 48 53.34	150.49	21 5 38.2	−441.1	71.35	15 58.5	58 31.4	II. S.
13	18 22.61	2.468	17 50 44.93	158.39	−23 21 0.2	−237.4	73.29	16 6.9	59 2.0	II. S.
14	19 22.91	2.543	18 55 9.70	162.87	24 3 5.5	− 21.6	74.34	16 14.3	59 29.2	II. N.
15	20 24.06	2.536	20 0 24.84	162.44	23 2 34.9	+279.8	74.20	16 20.1	59 50.2	II. N.
16	21 24.12	2.456	21 4 34.79	157.82	20 22 10.8	515.3	72.99	16 23.3	60 1.9	II. N.
17	22 21.67	2.336	22 6 13.92	150.61	16 16 33.6	702.2	71.13	16 23.2	60 1.7	II. N.
18	23 16.16	2.208	23 4 49.08	142.84	−11 8 27.9	+826.6	69.20	16 19.5	59 48.0	II. N.
20	0 7.82	2.101	0 0 33.86	136.36	− 5 23 42.2	886.3	67.58	16 12.2	59 21.0	II. N.
21	0 57.35	2.032	0 54 10.05	131.97	+ 0 32 44.5	886.6	66.47	16 1.7	58 42.7	I. S.
22	1 45.60	1.994	1 46 29.67	129.83	6 18 50.0	836.2	65.96	15 49.1	57 56.7	I. S.
23	2 33.41	1.993	2 38 22.67	129.76	11 36 13.1	744.6	65.97	15 35.7	57 7.3	I. S.
24	3 21.44	2.014	3 30 29.03	131.06	+16 10 11.0	+620.4	66.36	15 22.5	56 19.0	I. S.
25	4 10.10	2.043	4 23 13.09	132.75	19 49 17.1	471.5	66.91	15 10.6	55 34.9	I. S.
26	4 59.50	2.070	5 16 40.40	134.32	22 25 4.3	305.1	67.38	15 0.7	54 58.8	I. S.
27	5 49.34	2.080	6 10 36.54	135.05	23 52 5.2	+129.0	67.58	14 53.6	54 32.6	I. N.
28	6 39.19	2.068	7 4 32.40	134.31	24 8 1.3	− 48.9	67.38	14 49.3	54 17.0	I. N.
29	7 28.45	2.033	7 57 52.95	132.16	+23 13 47.2	−220.6	66.79	14 48.1	54 12.5	I. N.
30	8 16.64	1.981	8 50 8.66	129.03	21 13 14.6	−379.3	65.92	14 49.9	54 18.8	I. N.
31	9 3.49	1.924	9 41 4.09	125.61	18 12 42.4	−520.3	64.94	14 54.2	54 34.8	I. N.
Apr. 1	9 49.05	1.875	10 30 41.76	122.67	14 20 13.4	−638.6	64.09	15 0.7	54 58.7	I. N.
2	10 33.65	1.845	11 19 21.40	120.87	+ 9 45 14.4	−731.9	63.53	15 8.8	55 28.8	I. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Apr. 2	10 33.65	1.845	11 19 21.40	120.87	+ 9 45 14.4	−731.9	63.53	15 8.8	55 28.8	I. N.
3	11 17.84	1.843	12 7 36.74	120.75	+ 4 38 33.4	−796.4	63.46	15 18.0	56 2.4	I. N.
4	12 2.38	1.874	12 56 12.06	122.59	− 0 47 29.3	−837.8	63.94	15 27.5	56 37.4	I. N.
5	12 48.07	1.941	13 45 58.33	126.64	− 6 18 31.5	−830.4	65.04	15 36.8	57 11.7	II. N.
6	13 35.84	2.043	14 37 48.87	132.92	−11 37 49.0	−767.9	66.73	15 45.5	57 43.2	II. S.
7	14 26.47	2.178	15 32 31.51	140.90	−16 26 5.3	−664.2	68.82	15 53.0	58 10.9	II. S.
8	15 20.45	2.321	16 30 36.00	149.48	−20 22 9.0	−506.4	71.05	15 59.3	58 34.0	II. S.
9	16 17.70	2.444	17 31 56.88	156.90	−23 4 47.1	−298.4	72.91	16 4.2	58 52.4	II. S.
10	17 17.31	2.511	18 35 39.85	160.94	−24 16 22.9	− 54.9	73.95	16 8.0	59 6.0	II. N.
11	18 17.67	2.502	19 40 7.52	160.42	−23 47 25.8	+198.9	73.85	16 10.5	59 15.1	II. N.
12	19 16.94	2.425	20 43 30.39	155.80	−21 39 34.4	+434.7	72.70	16 11.5	59 19.0	II. N.
13	20 13.78	2.308	21 44 26.82	148.69	−18 5 4.0	629.1	70.96	16 11.0	59 17.0	II. N.
14	21 7.66	2.184	22 42 24.49	141.26	−13 23 13.0	770.3	68.98	16 8.7	59 8.7	II. N.
15	21 58.77	2.081	23 37 36.41	135.08	− 7 56 15.6	854.8	67.34	16 4.3	58 52.8	II. N.
16	22 47.82	2.013	0 30 43.97	130.96	− 2 6 34.8	884.6	66.23	15 58.0	58 28.6	II. N.
17	23 35.68	1.982	1 22 39.97	129.10	+ 3 44 45.0	+863.9	65.72	15 49.7	57 58.8	II. N.
19	0 23.22	1.985	2 14 16.61	129.27	9 18 31.1	797.8	65.77	15 39.8	57 23.2	I. N.
20	1 11.15	2.013	3 6 17.09	130.97	14 17 41.1	691.9	66.25	15 29.2	56 43.3	I. S.
21	1 59.94	2.053	3 59 8.89	133.40	18 27 40.4	553.0	66.94	15 18.4	56 4.0	I. S.
22	2 49.69	2.091	4 52 58.83	135.63	21 36 49.9	389.2	67.55	15 8.3	55 26.8	I. S.
23	3 40.15	2.109	5 47 30.97	136.76	+23 37 1.9	+210.0	67.96	14 59.9	54 54.5	I. S.
24	4 30.73	2.099	6 42 10.80	136.21	24 24 13.3	+ 26.1	67.88	14 53.4	54 31.8	I. N.
25	5 20.73	2.062	7 36 15.64	133.90	23 58 33.2	−152.5	67.31	14 49.5	54 18.2	I. N.
26	6 9.54	2.003	8 29 8.46	130.11	22 23 52.9	−317.9	66.41	14 48.8	54 15.0	I. N.
27	6 56.80	1.936	9 20 28.49	125.94	19 46 36.0	−465.0	65.35	14 50.9	54 23.0	I. N.
28	7 42.52	1.877	10 10 16.01	122.53	+16 14 40.7	−591.0	64.34	14 56.0	54 41.6	I. N.
29	8 27.04	1.838	10 58 51.19	120.42	11 56 45.9	−694.7	63.64	15 3.8	55 10.3	I. N.
30	9 10.96	1.828	11 46 49.77	119.81	7 2 12.1	−773.9	63.41	15 13.7	55 46.4	I. N.
May 1	9 55.05	1.853	12 34 59.06	121.36	+ 1 41 24.6	−825.4	63.78	15 25.1	56 28.5	I. N.
2	10 40.24	1.919	13 24 14.41	125.34	− 3 53 25.7	−841.1	64.73	15 37.1	57 12.7	I. N.
3	11 27.51	2.097	14 15 34.91	131.80	− 9 26 1.5	−815.8	66.46	15 48.8	57 55.7	I. N.
4	12 17.79	2.169	15 9 56.81	140.37	−14 39 49.4	−737.7	68.66	15 59.2	58 34.0	II. N.
5	13 11.76	2.329	16 8 0.08	150.00	−19 5 51.5	−595.6	71.10	16 7.6	59 4.5	II. S.
6	14 9.46	2.474	17 9 48.55	158.68	−22 25 10.5	−392.7	73.28	16 13.3	59 25.3	II. S.
7	15 10.05	2.560	18 14 29.94	163.90	−24 13 49.2	−144.4	74.60	16 16.0	59 35.5	II. N. S.
8	16 11.70	2.559	19 20 16.06	163.88	−24 18 28.7	+121.1	74.65	16 16.1	59 36.0	II. N.
9	17 12.27	2.472	20 24 56.80	158.71	−22 38 59.0	370.1	73.46	16 14.0	59 28.0	II. N.
10	18 10.06	2.337	21 26 50.13	150.45	−19 27 48.3	576.6	71.45	16 10.0	59 13.6	II. N.
11	19 4.36	2.190	22 25 13.24	141.63	−15 5 9.2	727.0	69.24	16 4.8	58 54.4	II. N.
12	19 55.36	2.066	23 20 18.27	134.18	− 9 53 31.3	822.0	67.29	15 58.6	58 31.8	II. N.
13	20 43.84	1.981	0 12 51.66	129.07	− 4 14 22.4	+865.7	65.90	15 51.7	58 6.4	II. N.
14	21 30.80	1.939	1 3 53.69	126.55	+ 1 32 50.3	863.1	65.17	15 44.2	57 38.6	II. N.
15	22 17.26	1.938	1 54 25.36	126.47	7 10 30.1	818.4	65.10	15 36.1	57 8.8	II. N.
16	23 4.09	1.969	2 45 19.58	128.33	12 22 21.5	734.5	65.57	15 27.5	56 37.5	II. N.
17	23 51.94	2.020	3 37 14.70	131.39	+16 53 20.4	+614.8	66.35	15 18.8	56 5.8	II. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
May 17	23 51.94	2.020	3 37 14.70	131.39	+16 53 20.4	+614.8	66.35	15 18.8	56 5.8	II. N.
19	0 41.08	2.072	4 30 27.92	134.65	20 30 0.0	464.1	67.22	15 10.4	55 34.4	I. S.
20	1 31.38	2.111	5 24 50.64	136.98	23 1 26.8	290.2	67.88	15 2.5	55 5.4	I. S.
21	2 22.27	2.121	6 19 49.00	137.48	24 20 38.6	+104.8	68.07	14 55.8	54 40.9	I. N. S
22	3 12.92	2.093	7 14 32.82	135.77	24 25 20.5	− 80.0	67.68	14 50.8	54 22.4	I. N.
23	4 2.49	2.033	8 8 11.72	132.20	+23 18 7.6	−253.1	66.81	14 47.9	54 11.9	I. N.
24	4 50.40	1.958	9 0 10.74	127.64	21 5 19.7	−407.1	65.67	14 47.6	54 10.8	I. N.
25	5 36.47	1.883	9 50 19.05	123.16	17 55 23.3	−538.7	64.51	14 50.2	54 20.0	I. N.
26	6 20.92	1.825	10 38 50.17	119.68	13 57 25.2	−647.4	63.56	14 55.5	54 40.2	I. N.
27	7 4.32	1.797	11 26 17.52	117.94	9 20 30.0	−733.5	63.05	15 3.7	55 10.8	I. N.
28	7 47.45	1.804	12 13 28.89	118.43	+ 4 13 48.4	−796.0	63.15	15 14.6	55 50.8	I. N.
29	8 31.28	1.855	13 1 22.51	121.50	− 1 12 34.0	−831.0	63.95	15 27.8	56 38.6	I. N.
30	9 16.89	1.954	13 51 3.74	127.42	− 6 46 16.7	−831.1	65.47	15 42.0	57 30.7	I. N.
31	10 5.43	2.099	14 43 40.42	136.13	−12 11 13.4	−784.8	67.64	15 56.3	58 23.3	I. N.
June 1	10 57.89	2.278	15 40 12.91	146.92	−17 6 16.1	−679.0	70.38	16 9.5	59 11.6	I. N.
2	11 54.81	2.463	16 41 14.12	158.09	−21 5 33.6	−504.6	73.11	16 20.1	59 50.8	I. N.
3	12 55.81	2.607	17 46 21.02	166.73	−23 41 46.2	−265.7	75.18	16 27.0	60 15.8	II. S.
4	13 59.27	2.658	18 53 55.15	169.83	−24 33 11.5	+ 12.6	75.96	16 29.7	60 26.2	II. N.
5	15 2.61	2.600	20 1 22.72	166.94	−23 31 52.8	289.2	75.17	16 28.2	60 20.5	II. N.
6	16 3.40	2.456	21 6 16.48	157.61	−20 46 54.8	525.0	73.17	16 23.1	60 1.4	II. N.
7	17 0.24	2.280	22 7 12.85	147.10	−16 39 49.6	+696.4	70.63	16 15.1	59 32.2	II. N.
8	17 53.00	2.121	23 4 3.02	137.73	−11 36 36.2	807.1	68.16	16 5.7	58 56.8	II. N.
9	18 42.35	2.001	23 57 29.65	130.47	− 6 1 41.5	858.9	66.35	15 55.2	58 18.8	II. N.
10	19 29.43	1.931	0 48 38.52	125.99	− 0 15 50.7	863.3	65.19	15 44.8	57 40.7	II. N.
11	20 15.38	1.906	1 38 39.57	124.54	+ 5 23 35.6	827.8	64.76	15 34.8	57 3.8	II. N.
12	21 1.26	1.923	2 28 36.58	125.56	+10 41 35.3	+756.5	64.96	15 25.3	56 29.2	II. N.
13	21 47.92	1.970	3 19 20.41	128.33	15 24 21.4	651.8	65.64	15 16.6	55 57.3	II. N.
14	22 35.89	2.029	4 11 23.12	131.94	19 19 0.6	516.3	66.54	15 8.6	55 28.0	II. N.
15	23 25.29	2.084	5 4 51.42	135.94	22 14 0.3	354.5	67.37	15 1.6	55 2.1	II. N.
17	0 15.74	2.114	5 59 23.45	137.06	24 0 19.8	+174.8	67.84	14 55.5	54 39.6	I. S.
18	1 6.48	2.107	6 54 12.98	136.61	+24 33 4.1	− 11.0	67.75	14 50.6	54 21.5	I. N. S.
19	1 56.57	2.060	7 48 23.03	133.83	23 52 21.9	−190.1	67.08	14 47.1	54 9.2	I. N.
20	2 45.18	1.987	8 41 4.18	129.39	22 3 9.3	−352.1	65.97	14 45.4	54 2.7	I. N.
21	3 31.86	1.903	9 31 49.14	124.36	19 13 42.7	−490.7	64.69	14 45.8	54 4.3	I. N.
22	4 16.60	1.828	10 20 37.66	119.86	15 33 53.6	−604.2	63.54	14 48.6	54 14.5	I. N.
23	4 59.81	1.777	11 7 53.45	116.76	+11 13 33.4	−693.6	62.74	14 54.1	54 34.6	I. N.
24	5 42.17	1.760	11 54 18.43	115.71	6 22 10.3	−759.7	62.47	15 2.3	55 4.8	I. N.
25	6 24.59	1.783	12 40 47.38	117.16	+ 1 9 2.4	−802.1	62.88	15 13.3	55 45.0	I. N.
26	7 8.15	1.855	13 28 24.77	121.47	− 4 15 43.7	−817.0	64.03	15 26.5	56 33.9	I. N.
27	7 54.03	1.977	14 18 21.96	128.85	− 9 39 42.2	−796.3	65.96	15 41.7	57 29.4	I. N.
28	8 43.45	2.149	15 11 51.87	139.16	−14 46 21.9	−727.7	68.57	15 57.7	58 28.1	I. N.
29	9 37.43	2.353	16 9 55.90	151.46	−19 13 42.1	−596.8	71.59	16 13.1	59 24.8	I. N.
30	10 36.36	2.553	17 12 58.21	163.11	−22 34 37.7	−394.4	74.44	16 26.4	60 13.8	I. N.
July 1	11 39.48	2.689	18 20 11.94	171.63	−24 21 21.7	−129.4	76.36	16 36.1	60 49.1	I. S.
2	12 44.57	2.711	19 29 24.87	172.94	−24 14 22.4	+165.4	76.66	16 40.4	61 5.5	II. S.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
July 2	12 44.57	2.711	19 29 24.87	172.94	−24 14 22.4	+165.4	76.66	16 40.4	61 5.5	II. S.
3	13 48.70	2.615	20 37 39.50	167.09	−22 11 24.2	441.2	75.40	16 39.9	61 2.9	II. N.
4	14 49.44	2.427	21 42 30.51	156.75	−18 28 56.2	657.7	72.91	16 33.9	60 40.9	II. N.
5	15 45.76	2.240	22 42 55.54	145.55	−13 34 46.7	799.5	70.20	16 23.8	60 4.1	II. N.
6	16 37.90	2.105	23 39 9.10	136.08	− 7 58 33.4	870.5	67.86	16 11.3	59 17.9	II. N.
7	17 26.83	1.994	0 32 9.53	129.51	− 2 6 1.6	+883.8	66.17	15 57.5	58 27.4	II. N.
8	18 13.76	1.932	1 23 9.85	126.02	+ 3 42 21.4	851.7	65.23	15 43.8	57 37.2	II. N.
9	18 59.89	1.919	2 13 21.19	125.35	9 10 26.5	783.3	65.06	15 31.0	56 50.0	II. N.
10	19 46.20	1.945	3 3 44.18	126.89	14 4 51.1	683.9	65.43	15 19.5	56 7.9	II. N.
11	20 33.44	1.994	3 55 2.97	129.84	18 13 45.6	556.1	66.15	15 9.7	55 31.6	II. N.
12	21 21.97	2.049	4 47 39.36	133.11	+21 26 28.8	+403.4	66.95	15 1.5	55 1.5	II. N.
13	22 11.70	2.090	5 41 27.86	135.63	23 33 58.0	231.2	67.54	14 54.9	54 37.4	II. N.
14	23 2.08	2.101	6 35 55.69	136.27	24 30 4.1	+ 48.4	67.66	14 49.9	54 18.8	II. S.
15	23 52.27	2.074	7 30 11.37	134.60	24 12 52.0	−133.1	67.22	14 46.4	54 5.7	II. S.
17	0 41.35	2.011	8 23 21.04	130.90	22 45 15.2	−301.7	66.25	14 44.3	53 58.3	I. S.
18	1 28.68	1.931	9 14 45.44	126.03	+20 14 16.6	−448.8	64.98	14 43.6	53 56.5	I. N.
19	2 14.02	1.849	10 4 9.75	121.08	16 49 34.8	−570.0	63.72	14 45.1	54 0.8	I. N.
20	2 57.54	1.782	10 51 44.52	117.06	12 41 46.2	−664.6	62.67	14 48.2	54 12.9	I. N.
21	3 39.76	1.742	11 38 1.01	114.70	8 1 17.3	−733.7	62.07	14 53.6	54 32.5	I. N.
22	4 21.44	1.739	12 23 45.64	114.46	+ 2 58 5.3	−778.1	62.07	15 1.3	55 0.9	I. N.
23	5 3.56	1.778	13 9 55.87	116.85	− 2 17 57.4	−797.7	62.77	15 11.3	55 37.8	I. N.
24	5 47.19	1.866	13 57 37.52	122.13	− 7 36 5.1	−787.8	64.23	15 23.8	56 23.7	I. N.
25	6 33.53	2.004	14 48 2.04	130.45	−12 43 12.9	−741.3	66.45	15 38.3	57 16.9	I. N.
26	7 23.74	2.188	15 42 19.81	141.50	−17 22 16.4	−644.9	69.24	15 53.8	58 13.8	I. N.
27	8 18.73	2.397	16 41 24.38	154.04	−21 11 7.0	−486.0	72.35	16 10.0	59 14.1	I. N.
28	9 18.62	2.586	17 45 24.08	165.49	−23 43 32.1	−262.4	75.02	16 25.0	60 8.7	I. N. S.
29	10 22.28	2.699	18 53 11.12	172.26	−24 34 24.0	+ 15.9	76.58	16 37.0	60 52.3	I. S.
30	11 27.30	2.695	20 2 19.62	172.00	−23 28 54.5	308.3	76.48	16 44.2	61 19.0	I. S.
31	12 30.83	2.582	21 9 58.01	165.23	−20 30 24.5	571.9	74.86	16 45.6	61 25.0	II. S.
Aug. 1	13 30.81	2.412	22 14 3.37	155.00	−16 0 1.4	765.3	72.43	16 41.3	61 8.3	II. N.
2	14 26.59	2.241	23 13 55.90	144.68	−10 28 26.4	+878.4	69.94	16 31.7	60 33.1	II. N.
3	15 18.62	2.104	0 10 3.04	136.42	− 4 26 53.8	918.0	67.92	16 18.4	59 44.0	II. N.
4	16 7.93	2.014	1 3 26.25	131.04	+ 1 38 1.4	898.2	66.57	16 3.2	58 47.7	II. N.
5	16 55.69	1.973	1 55 15.75	128.55	7 25 33.4	833.1	66.00	15 47.3	57 49.3	II. N.
6	17 42.95	1.972	2 46 36.09	128.51	12 39 47.9	733.1	66.03	15 32.1	56 54.3	II. N.
7	18 30.58	2.001	3 38 18.01	130.21	+17 8 12.7	+604.7	66.45	15 18.3	56 4.7	II. N.
8	19 19.08	2.041	4 30 52.74	132.65	20 40 29.2	453.0	67.03	15 7.3	55 23.0	II. N.
9	20 8.53	2.080	5 24 24.25	134.98	23 8 13.5	283.0	67.56	14 58.3	54 49.8	II. N.
10	20 58.74	2.097	6 18 41.75	136.00	24 25 27.9	+101.9	67.74	14 51.5	54 25.1	II. S.
11	21 48.91	2.078	7 12 56.63	134.91	24 29 35.6	− 80.6	67.42	14 47.0	54 8.3	II. S.
12	22 38.27	2.029	8 6 23.05	131.95	+23 22 8.5	−254.1	66.58	14 44.4	53 58.9	II. S.
13	23 26.14	1.957	8 58 19.51	127.58	21 8 40.7	−409.3	65.37	14 43.6	53 55.9	II. S.
15	0 12.13	1.876	9 48 23.36	122.75	17 57 50.1	−540.2	64.09	14 44.4	53 58.9	
16	0 56.27	1.804	10 36 35.27	118.40	14 0 3.4	−644.0	62.93	14 46.7	54 7.4	
17	1 38.90	1.752	11 23 16.48	115.30	+ 9 26 14.9	−720.4	62.12	14 50.6	54 21.8	I. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Aug. 17	1 38.90	1.752	11 23 16.48	115.30	+ 9 26 14.9	−720.4	62.12	14 50.6	54 21.8	I. N.
18	2 20.63	1.731	12 9 4.18	114.02	+ 4 27 17.7	−769.9	61.81	14 56.0	54 41.7	I. N.
19	3 2.29	1.747	12 54 47.06	114.96	− 0 46 5.1	−792.5	62.14	15 3.2	55 7.9	I. N.
20	3 44.81	1.804	13 41 22.17	118.42	− 6 2 52.0	−786.5	63.15	15 12.1	55 41.0	I. N.
21	4 29.26	1.908	14 29 52.72	124.60	−11 10 52.0	−747.6	64.89	15 23.0	56 20.6	I. N.
22	5 16.71	2.054	15 21 23.71	133.44	−15 55 33.7	−668.4	67.26	15 35.6	57 6.6	I. N.
23	6 8.11	2.234	16 16 52.97	144.31	−19 58 58.6	−539.2	70.04	15 49.4	57 57.5	I. N.
24	7 4.01	2.421	17 16 52.83	155.61	−22 59 28.3	−352.4	72.82	16 3.9	58 50.7	I. N.
25	8 4.10	2.574	18 21 4.52	164.69	−24 33 51.1	−109.9	74.97	16 18.0	59 42.8	I. S.
26	9 6.92	2.642	19 28 0.29	168.79	−24 23 0.7	+168.2	75.91	16 30.6	60 27.9	I. S.
27	10 10.14	2.606	20 35 20.54	166.77	−22 19 31.2	+445.0	75.33	16 39.0	60 59.6	I. S.
28	11 11.49	2.494	21 40 47.90	159.91	−18 32 18.9	679.9	73.64	16 42.8	61 13.7	I. S.
29	12 9.59	2.348	22 43 0.42	151.11	−13 24 31.0	845.0	71.49	16 41.2	61 7.8	II. S.
30	13 4.24	2.212	23 41 44.88	143.17	− 7 26 26.1	931.8	69.48	16 34.0	60 41.1	II. N.
31	13 56.03	2.111	0 37 37.04	136.88	− 1 8 36.5	945.7	67.96	16 22.2	59 58.1	II. N.
Sept. 1	14 45.91	2.053	1 31 34.93	133.40	+ 5 2 19.5	+899.6	67.10	16 7.5	59 4.0	II. N.
2	15 34.90	2.035	2 24 39.04	132.32	10 44 59.5	806.8	66.94	15 51.5	58 4.8	II. N.
3	16 23.85	2.048	3 17 40.44	133.05	15 42 56.0	677.6	67.18	15 35.5	57 6.3	II. N.
4	17 13.31	2.075	4 11 12.92	134.74	19 43 41.0	521.9	67.65	15 20.8	56 12.5	II. N.
5	18 3.48	2.103	5 5 27.84	136.40	22 38 6.2	347.8	68.08	15 8.4	55 26.8	II. N.
6	18 54.14	2.114	6 0 12.30	137.03	+24 20 12.9	+162.0	68.24	14 58.5	54 50.7	II. S.
7	19 44.74	2.097	6 54 52.98	136.01	24 47 33.1	− 24.6	67.94	14 51.4	54 24.5	II. S.
8	20 34.56	2.050	7 48 47.02	133.19	24 1 25.6	−203.6	67.13	14 47.0	54 8.2	II. S.
9	21 22.97	1.962	8 41 15.88	129.04	22 6 45.5	−366.2	65.97	14 45.1	54 1.2	II. S.
10	22 9.57	1.902	9 31 56.56	124.34	19 11 20.3	−506.6	64.66	14 45.4	54 1.1	II. S.
11	22 54.34	1.830	10 20 46.67	119.96	+15 24 48.2	−621.5	63.42	14 47.5	54 10.2	II. S.
12	23 37.56	1.776	11 8 3.11	116.64	10 57 41.0	−709.8	62.48	14 51.2	54 24.0	II. S.
14	0 19.78	1.746	11 54 17.95	114.91	6 0 56.4	−769.6	62.00	14 56.3	54 42.6	I. S.
15	1 1.63	1.749	12 40 14.23	115.14	+ 0 45 52.4	−805.0	62.09	15 2.4	55 5.2	I. N.
16	1 44.04	1.791	13 26 42.68	117.62	− 4 35 44.7	−801.9	62.83	15 9.7	55 31.6	I. N.
17	2 27.92	1.872	14 14 38.89	122.48	− 9 51 4.6	−768.8	64.21	15 17.8	56 1.6	I. N.
18	3 14.20	1.991	15 5 0.01	129.68	−14 45 35.3	−696.8	66.20	15 26.9	56 35.0	I. N.
19	4 3.75	2.144	15 58 37.75	138.76	−19 2 33.1	−579.7	68.62	15 36.9	57 11.8	I. N.
20	4 57.12	2.305	16 56 5.43	148.57	−22 22 47.4	−412.3	71.15	15 47.8	57 52.6	I. N.
21	5 54.25	2.445	17 57 19.39	157.18	−24 26 3.6	−195.5	73.29	15 59.0	58 33.3	I. N. s.
22	6 54.22	2.534	19 1 23.44	162.31	−24 54 30.2	+ 58.4	74.51	16 10.0	59 13.4	I. S.
23	7 55.28	2.551	20 6 33.92	162.53	−23 37 54.0	323.9	74.57	16 20.0	59 49.7	I. S.
24	8 55.51	2.469	21 10 53.86	158.44	−20 38 1.3	568.9	73.45	16 27.6	60 16.5	I. S.
25	9 53.46	2.353	22 12 57.44	151.70	−16 9 10.2	764.7	71.73	16 31.8	60 33.3	I. S.
26	10 48.63	2.243	23 12 13.12	144.80	−10 34 43.7	895.1	69.98	16 32.0	60 34.2	I. S.
27	11 41.29	2.152	0 8 57.86	139.32	− 4 22 15.3	+955.1	68.59	16 27.6	60 17.7	I. S.
28	12 32.20	2.097	1 3 57.14	136.05	+ 2 0 31.2	948.0	67.77	16 18.9	59 45.4	II. N.S.
29	13 22.26	2.081	1 58 5.54	135.03	8 8 20.6	882.0	67.53	16 6.5	59 0.6	II. N.
30	14 12.30	2.093	2 52 12.51	135.81	13 39 39.5	767.4	67.80	15 52.3	58 8.1	II. N.
Oct. 1	15 2.87	2.123	3 46 52.17	137.58	+18 17 10.7	+614.9	68.32	15 37.3	57 13.3	II. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Oct. 1	15 2.87	2.123	3 46 52.17	137.58	+18 17 10.7	+614.9	68.32	15 37.3	57 13.3	II. N.
2	15 54.19	2.152	4 42 16.02	139.98	21 48 2.5	435.9	68.91	15 23.0	56 20.7	II. N.
3	16 46.01	2.162	5 38 10.18	139.92	24 3 56.9	242.2	69.05	15 10.4	55 34.4	II. N.
4	17 37.73	2.145	6 33 58.73	138.74	25 1 24.4	+ 45.4	68.77	15 0.1	54 56.8	II. S.
5	18 28.59	2.091	7 28 55.52	135.65	24 41 32.0	−142.7	67.97	14 52.7	54 29.6	II. S.
6	19 17.91	2.015	8 22 19.19	131.15	+23 9 31.0	−314.0	66.80	14 48.3	54 13.5	II. S.
7	20 5.28	1.931	9 13 45.55	126.05	20 33 14.5	−463.3	65.36	14 46.9	54 8.1	II. S.
8	20 50.66	1.852	10 3 12.27	121.31	17 2 7.6	−588.1	64.01	14 48.0	54 12.6	II. S.
9	21 34.34	1.792	10 50 57.10	117.66	12 46 9.5	−688.5	62.94	14 51.6	54 25.6	II. S.
10	22 16.88	1.758	11 37 33.00	115.64	7 55 34.1	−761.0	62.30	14 57.0	54 45.6	II. S.
11	22 59.00	1.758	12 23 43.48	115.59	+ 2 41 3.1	−806.9	62.26	15 3.9	55 10.9	S.
12	23 41.53	1.793	13 10 18.83	117.75	− 2 45 50.1	−822.2	62.85	15 11.8	55 39.6	II. S.
14	0 25.38	1.868	13 58 13.63	122.22	− 8 12 1.0	−802.4	64.07	15 20.1	56 10.0	I. N. S.
15	1 11.47	1.979	14 48 22.79	126.92	−13 22 17.4	−741.5	65.90	15 28.5	56 40.9	I. N.
16	2 0.60	2.119	15 41 35.27	137.30	−17 59 0.1	−633.5	68.16	15 36.8	57 11.3	I. N.
17	2 53.29	2.271	16 38 21.85	146.51	−21 42 22.8	−474.3	70.54	15 44.7	57 40.7	I. N.
18	3 49.47	2.404	17 38 38.52	154.50	−24 12 8.4	−266.3	72.59	15 52.4	58 8.8	I. N.
19	4 48.27	2.481	18 41 32.93	159.26	−25 10 49.1	− 22.2	73.81	15 59.5	58 35.1	I. S.
20	5 48.10	2.480	19 45 29.11	159.52	−24 28 16.4	+234.7	73.90	16 6.1	58 59.0	I. S.
21	6 47.15	2.422	20 48 38.22	155.59	−22 5 0.7	476.3	72.93	16 11.7	59 19.6	I. S.
22	7 44.06	2.318	21 49 38.80	149.24	−18 12 14.6	+678.9	71.34	16 15.7	59 34.6	I. S.
23	8 38.31	2.207	22 47 59.32	142.63	−13 8 48.9	828.1	69.61	16 18.0	59 42.6	I. S.
24	9 30.15	2.119	23 43 54.96	137.38	− 7 17 31.2	918.0	68.21	16 17.5	59 40.9	I. S.
25	10 20.33	2.069	0 38 10.37	134.35	− 1 2 22.0	947.7	67.37	16 14.0	59 28.2	I. S.
26	11 9.78	2.058	1 31 42.08	133.71	+ 5 12 54.2	919.1	67.17	16 7.5	59 4.3	I. S.
27	11 59.41	2.082	2 25 24.45	135.14	+11 5 45.1	+836.5	67.54	15 58.2	58 30.1	II. S.
28	12 49.90	2.128	3 19 58.81	137.87	16 15 48.3	706.1	68.27	15 46.8	57 48.5	II. N.
29	13 41.56	2.176	4 15 43.64	140.78	20 25 33.5	536.8	69.07	15 34.4	57 2.8	II. N.
30	14 34.21	2.206	5 12 27.95	142.59	23 22 0.2	343.2	69.59	15 21.8	56 16.3	II. N.
31	15 27.19	2.200	6 9 31.58	142.24	24 57 38.1	+136.2	69.60	15 10.5	55 34.7	II. N.
Nov. 1	16 19.52	2.153	7 5 56.80	139.40	+25 11 29.9	− 66.3	68.94	15 0.8	55 0.0	II. S.
2	17 10.28	2.072	8 0 47.48	134.53	24 7 51.0	−249.1	67.72	14 53.7	54 33.1	II. S.
3	17 58.87	1.975	8 53 26.82	126.68	21 55 12.3	−409.3	66.20	14 49.4	54 17.5	II. S.
4	18 45.10	1.880	9 43 45.28	122.99	18 43 50.1	−543.0	64.66	14 48.2	54 13.0	II. S.
5	19 29.27	1.804	10 31 58.83	118.40	14 44 13.3	−650.9	63.38	14 50.1	54 19.7	II. S.
6	20 11.93	1.757	11 18 42.32	115.56	+10 6 22.5	−734.4	62.53	14 54.7	54 36.8	II. S.
7	20 53.88	1.745	12 4 42.84	114.87	+ 4 59 58.7	−793.5	62.27	15 1.8	55 2.7	II. S.
8	21 36.03	1.774	12 50 55.23	116.58	− 0 24 50.3	−826.0	62.68	15 10.7	55 35.6	II. S.
9	22 19.37	1.845	13 38 19.06	120.85	− 5 56 29.9	−826.6	63.79	15 20.9	56 12.9	II. S.
10	23 4.91	1.958	14 27 55.60	127.64	−11 20 47.8	−787.6	65.57	15 31.4	56 51.8	II. S.
11	23 53.60	2.105	15 20 41.75	136.56	−16 20 5.1	−699.7	67.90	15 41.7	57 29.4	I. S.
13	0 46.12	2.272	16 17 17.78	146.54	−20 33 10.0	−555.2	70.44	15 50.9	58 3.1	I. N.
14	1 42.52	2.422	17 17 47.95	155.55	−23 36 57.1	−353.7	72.74	15 58.4	58 31.0	I. N.
15	2 41.97	2.518	18 21 21.42	161.31	−25 10 25.6	−107.3	74.32	16 4.1	58 51.9	I. N. S.
16	3 42.71	2.525	19 26 12.16	161.85	−25 0 27.7	+157.5	74.55	16 7.9	59 5.7	I. S.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Nov. 16	3 42.71	2.525	19 26 12.16	161.85	−25 0 27.7	+157.5	74.55	16 7.9	59 5.7	I. S.
17	4 42.61	2.452	20 30 12.43	157.38	−23 6 13.9	408.0	73.43	16 9.8	59 12.9	I. S.
18	5 40.01	2.327	21 31 42.42	149.84	−19 39 11.4	618.3	71.54	16 10.2	59 14.3	I. S.
19	6 34.22	2.194	22 30 0.63	141.83	−14 58 43.8	772.8	69.53	16 9.3	59 11.0	I. S.
20	7 25.48	2.085	23 25 21.01	135.27	− 9 27 9.2	872.7	67.82	16 7.1	59 2.9	I. S.
21	8 14.60	2.017	0 18 32.84	131.19	− 3 26 32.4	+930.4	66.73	16 3.7	58 50.1	I. S.
22	9 2.64	1.995	1 10 40.02	129.88	+ 2 42 11.6	915.2	66.30	15 58.8	58 32.2	I. S.
23	9 50.69	2.015	2 2 47.31	131.13	8 39 8.6	861.4	66.57	15 52.5	58 8.9	I. S.
24	10 39.64	2.069	2 55 49.62	134.33	14 5 8.4	760.7	67.35	15 44.7	57 40.5	I. S.
25	11 30.12	2.137	3 50 22.18	138.40	18 42 0.3	616.5	68.39	15 35.7	57 7.5	I. S.
26	12 22.17	2.197	4 46 30.79	142.05	+22 13 41.6	+436.5	69.33	15 26.1	56 32.0	II. N.
27	13 15.34	2.225	5 43 45.79	143.71	24 28 13.0	233.5	69.78	15 16.2	55 55.8	II. N.
28	14 8.60	2.204	6 41 7.07	142.47	25 19 42.9	+ 24.7	69.54	15 6.9	55 21.3	II. N. S.
29	15 0.77	2.135	7 37 22.45	138.34	24 49 19.0	−173.1	68.56	14 58.8	54 51.8	II. S.
30	15 50.86	2.035	8 31 32.77	132.30	23 4 14.6	−347.2	67.06	14 52.6	54 29.1	II. S.
Dec. 1	16 38.38	1.925	9 23 8.17	125.70	+20 15 17.7	−492.2	65.36	14 48.8	54 15.4	II. S.
2	17 23.37	1.828	10 12 11.51	119.82	16 34 18.3	−608.0	63.82	14 47.9	54 11.8	II. S.
3	18 6.32	1.757	10 59 11.86	115.55	12 12 24.4	−697.5	62.66	14 49.9	54 19.3	II. S.
4	18 47.99	1.722	11 44 55.41	113.48	7 19 33.5	−763.2	62.05	14 55.0	54 37.9	II. S.
5	19 29.32	1.730	12 30 19.01	113.97	+ 2 5 0.5	−805.9	62.14	15 2.9	55 7.2	II. S.
6	20 11.39	1.784	13 16 26.39	117.16	− 3 21 38.7	−823.0	62.98	15 13.4	55 45.7	II. S.
7	20 55.32	1.885	14 4 25.90	123.31	− 8 49 0.3	−807.9	64.59	15 25.8	56 31.0	II. S.
8	21 42.24	2.034	14 55 26.76	132.26	−14 2 18.0	−750.4	66.90	15 39.1	57 19.9	II. S.
9	22 33.23	2.220	15 50 29.98	143.34	−18 42 5.8	−637.9	69.69	15 52.3	58 8.3	II. S.
10	23 28.79	2.409	16 50 8.91	154.82	−22 24 21.2	−461.2	72.54	16 4.2	58 52.1	II. S.
12	0 28.56	2.559	17 54 1.73	163.85	−24 43 17.6	−223.1	74.71	16 13.7	59 27.6	I. N.
13	1 30.96	2.619	19 0 32.70	167.48	−25 18 0.2	+ 53.6	75.63	16 20.0	59 50.1	I. N. s.
14	2 33.49	2.570	20 7 10.88	164.51	−24 0 22.4	331.0	74.96	16 22.2	59 58.5	I. S.
15	3 33.72	2.438	21 11 31.22	156.57	−20 58 10.7	568.0	73.11	16 21.3	59 54.8	I. S.
16	4 30.29	2.276	22 12 11.13	146.78	−16 33 45.1	748.0	70.75	16 17.4	59 40.4	I. S.
17	5 23.06	2.128	23 9 2.59	137.91	−11 11 24.7	+856.2	68.54	16 11.3	59 18.3	I. S.
18	6 12.76	2.027	0 2 49.78	131.56	− 5 16 38.4	908.2	66.90	16 4.0	58 51.6	I. S.
19	7 0.55	1.966	0 54 41.11	128.26	+ 0 48 41.9	910.4	66.02	15 56.1	58 22.1	I. S.
20	7 47.62	1.963	1 45 49.80	127.96	6 45 40.7	867.5	65.89	15 47.9	57 51.8	I. S.
21	8 35.09	2.001	2 37 22.91	130.18	12 17 12.5	783.6	66.40	15 39.4	57 21.2	I. S.
22	9 23.82	2.065	3 30 11.68	134.09	+17 7 12.5	+660.0	67.37	15 31.2	56 50.7	I. S.
23	10 14.28	2.138	4 24 43.03	138.47	21 0 28.4	500.2	68.45	15 23.0	56 20.6	I. S.
24	11 6.31	2.192	5 20 50.20	141.79	23 43 47.2	311.9	69.26	15 15.0	55 51.1	I. S.
25	11 59.19	2.207	6 17 50.06	142.63	25 7 58.1	+107.6	69.45	15 7.3	55 23.0	I. S.
26	12 51.85	2.170	7 14 32.79	140.35	25 9 58.2	− 95.7	68.90	15 0.2	54 57.1	I. S.
27	13 42.98	2.085	8 9 45.93	135.34	+23 53 33.0	−262.0	67.64	14 54.1	54 34.5	I. S.
28	14 31.76	1.978	9 2 37.24	128.81	21 27 57.8	−440.4	65.99	14 49.4	54 17.4	II. S.
29	15 17.89	1.867	9 52 47.86	122.19	18 5 20.5	−567.2	64.14	14 46.5	54 7.3	II. S.
30	16 1.52	1.775	10 40 30.69	116.66	13 58 11.0	−663.8	62.84	14 46.1	54 5.3	II. S.
31	16 43.32	1.714	11 26 22.31	113.02	9 17 53.7	−733.4	61.88	14 48.2	54 13.0	II. S.
32	17 24.13	1.675	12 11 13.99	111.73	+ 4 14 31.1	−780.0	61.56	14 53.2	54 31.3	II. S.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Jan. 0	1 3.5	19 44 55.21	−23 23 53.6	7.0	2.6	0.19
1	1 6.3	19 51 41.25	23 4 7.7	7.1	2.6	0.19
2	1 9.0	19 58 22.20	22 42 53.3	7.2	2.7	0.19
3	1 11.6	20 4 57.16	22 20 13.2	7.3	2.7	0.20
4	1 14.1	20 11 25.12	21 56 10.8	7.4	2.8	0.20
5	1 16.5	20 17 44.94	−21 30 50.6	7.5	2.8	0.21
6	1 18.8	20 23 55.33	21 4 18.1	7.6	2.9	0.21
7	1 20.8	20 29 54.84	20 36 39.8	7.8	3.0	0.21
8	1 22.7	20 35 41.82	20 8 3.9	7.9	3.0	0.22
9	1 24.3	20 41 14.43	19 38 40.3	8.1	3.1	0.22
10	1 25.6	20 46 30.61	−19 8 40.2	8.3	3.1	0.23
11	1 26.6	20 51 28.08	18 38 16.3	8.5	3.2	0.23
12	1 27.3	20 56 4.36	18 7 44.0	8.8	3.3	0.23
13	1 27.5	21 0 16.72	17 37 20.7	9.0	3.4	0.24
14	1 27.3	21 4 2.28	17 7 25.7	9.3	3.5	0.24
15	1 26.7	21 7 18.02	−16 38 20.3	9.5	3.6	0.25
16	1 25.5	21 10 0.85	16 10 27.4	9.8	3.7	0.25
17	1 23.7	21 12 7.71	15 44 11.0	10.1	3.8	0.26
18	1 21.2	21 13 35.70	15 19 56.0	10.4	3.9	0.26
19	1 18.0	21 14 22.27	14 58 7.4	10.8	4.0	0.27
20	1 14.1	21 14 25.44	−14 39 8.6	11.1	4.2	0.28
21	1 9.5	21 13 43.96	14 23 20.7	11.4	4.3	0.29
22	1 4.1	21 12 17.53	14 11 0.8	11.7	4.4	0.30
23	0 58.0	21 10 7.08	14 2 21.6	12.0	4.5	0.30
24	0 51.2	21 7 14.90	13 57 29.7	12.3	4.7	0.31
25	0 43.8	21 3 44.74	−13 56 24.1	12.6	4.8	0.32
26	0 35.9	20 59 41.79	13 58 57.0	12.9	4.9	0.33
27	0 27.5	20 55 12.54	14 4 53.7	13.1	5.0	0.33
28	0 18.7	20 50 24.54	14 13 53.1	13.3	5.0	0.34
29	0 9.8	20 45 25.97	14 25 29.2	13.4	5.0	0.34
30	0 0.9	20 40 25.19	−14 39 13.0	13.5	5.1	0.35
30	23 52.1	20 35 30.38	14 54 34.3	13.5	5.1	0.35
31	23 43.5	20 30 48.97	15 11 3.9	13.5	5.1	0.35
Feb. 1	23 35.2	20 26 27.35	15 28 14.3	13.4	5.0	0.35
2	23 27.3	20 22 30.83	15 45 40.9	13.3	5.0	0.34
3	23 20.0	20 19 3.37	−16 3 2.4	13.1	4.9	0.34
4	23 13.2	20 16 7.64	16 20 1.4	12.9	4.9	0.33
5	23 6.8	20 13 45.19	16 36 23.8	12.7	4.8	0.33
6	23 1.0	20 11 56.61	16 51 58.4	12.5	4.7	0.32
7	22 55.8	20 10 41.73	17 6 36.1	12.3	4.7	0.32
8	22 51.2	20 9 59.68	−17 20 10.4	12.1	4.6	0.31
9	22 47.1	20 9 49.20	17 32 35.9	11.8	4.5	0.30
10	22 43.6	20 10 8.72	17 43 48.9	11.6	4.4	0.30
11	22 40.4	20 10 56.49	17 53 46.5	11.4	4.3	0.29
12	22 37.6	20 12 10.67	18 2 26.7	11.2	4.2	0.29
13	22 35.3	20 13 49.38	−18 9 47.9	10.9	4.1	0.28
14	22 33.4	20 15 50.80	−18 15 48.8	10.7	4.1	0.28
Feb. 14	22 33.4	20 15 50.80	−18 15 48.8	10.7	4.1	0.28
15	22 31.9	20 18 13.15	18 20 28.6	10.5	4.0	0.28
16	22 30.7	20 20 54.75	18 23 46.8	10.3	3.9	0.27
17	22 29.7	20 23 54.02	18 25 42.8	10.1	3.8	0.27
18	22 29.0	20 27 9.49	18 26 16.5	9.9	3.8	0.26
19	22 28.6	20 30 39.81	−18 25 27.9	9.7	3.7	0.26
20	22 28.4	20 34 23.72	18 23 16.9	9.6	3.6	0.26
21	22 28.4	20 38 20.05	18 19 43.3	9.4	3.6	0.25
22	22 28.5	20 42 27.77	18 14 47.4	9.3	3.5	0.25
23	22 28.9	20 46 45.91	18 8 29.3	9.1	3.4	0.24
24	22 29.4	20 51 13.62	−18 0 49.3	9.0	3.4	0.24
25	22 30.1	20 55 50.09	17 51 47.5	8.9	3.3	0.24
26	22 30.9	21 0 34.61	17 41 24.1	8.7	3.3	0.23
27	22 31.8	21 5 26.50	17 29 39.5	8.6	3.3	0.23
28	22 32.8	21 10 25.20	17 16 34.0	8.5	3.2	0.22
Mar. 1	22 33.9	21 15 30.19	−17 2 7.9	8.4	3.2	0.22
2	22 35.2	21 20 40.99	16 46 21.5	8.3	3.1	0.22
3	22 36.5	21 25 57.16	16 29 15.0	8.2	3.1	0.22
4	22 37.9	21 31 18.32	16 10 49.0	8.1	3.1	0.21
5	22 39.4	21 36 44.13	15 51 3.7	8.0	3.0	0.21
6	22 40.9	21 42 14.28	−15 29 59.5	7.9	3.0	0.21
7	22 42.5	21 47 48.51	15 7 36.8	7.8	3.0	0.20
8	22 44.2	21 53 26.58	14 43 56.2	7.7	2.9	0.20
9	22 46.0	21 59 8.28	14 18 57.9	7.7	2.9	0.20
10	22 47.9	22 4 53.44	13 52 42.2	7.6	2.9	0.19
11	22 49.7	22 10 41.90	−13 25 9.6	7.5	2.8	0.19
12	22 51.6	22 16 33.54	12 56 20.7	7.5	2.8	0.19
13	22 53.6	22 22 28.26	12 26 15.9	7.4	2.8	0.19
14	22 55.6	22 28 25.98	11 54 55.7	7.3	2.8	0.19
15	22 57.7	22 34 26.65	11 22 20.4	7.3	2.7	0.18
16	22 59.8	22 40 30.23	−10 48 30.6	7.2	2.7	0.18
17	23 2.0	22 46 36.71	10 13 26.8	7.1	2.7	0.18
18	23 4.2	22 52 46.09	9 37 9.6	7.0	2.7	0.18
19	23 6.4	22 58 58.40	8 59 39.5	7.0	2.6	0.18
20	23 8.7	23 5 13.67	8 20 57.3	6.9	2.6	0.18
21	23 11.1	23 11 31.97	− 7 41 3.7	6.9	2.6	0.18
22	23 13.5	23 17 53.37	6 59 59.4	6.8	2.6	0.18
23	23 15.9	23 24 17.94	6 17 45.2	6.8	2.6	0.18
24	23 18.4	23 30 45.81	5 34 22.2	6.8	2.6	0.17
25	23 21.0	23 37 17.11	4 49 51.2	6.7	2.6	0.17
26	23 23.7	23 43 51.96	− 4 4 13.4	6.7	2.5	0.17
27	23 26.4	23 50 30.49	3 17 30.3	6.7	2.5	0.17
28	23 28.1	23 57 12.85	2 29 43.5	6.7	2.5	0.17
29	23 31.9	0 3 59.20	1 40 54.9	6.6	2.5	0.17
30	23 34.8	0 10 49.69	0 51 6.4	6.6	2.5	0.17
31	23 37.8	0 17 44.47	− 0 0 20.4	6.6	2.5	0.17
32	23 40.9	0 24 43.65	+ 0 51 20.2	6.6	2.5	0.17

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	23 40.9	0 24 43.65	+ 0 51 20.2	6.6	2.5	0.17	May 18	0 59.9	4 45 21.55	+23 18 59.5	14.1	5.3	0.39
2	23 44.0	0 31 47.37	1 43 51.8	6.6	2.5	0.17	19	0 55.8	4 45 14.98	23 4 20.4	14.4	5.4	0.39
3	23 47.2	0 38 55.75	2 37 10.5	6.6	2.5	0.17	20	0 51.4	4 44 49.50	22 48 20.9	14.7	5.5	0.40
4	23 50.4	0 46 8.87	3 31 12.0	6.6	2.5	0.17	21	0 46.8	4 44 6.08	22 31 7.1	14.9	5.6	0.41
5	23 53.7	0 53 26.74	4 25 51.0	6.6	2.5	0.17	22	0 41.9	4 43 5.85	22 12 46.2	15.1	5.7	0.41
6	23 57.1	1 0 49.33	+ 5 21 1.7	6.6	2.5	0.17	23	0 36.6	4 41 50.20	+21 53 26.1	15.3	5.8	0.42
8	0 0.7	1 8 16.57	6 16 37.1	6.6	2.5	0.17	24	0 31.2	4 40 20.74	21 33 15.9	15.5	5.8	0.42
9	0 4.3	1 15 48.31	7 12 29.5	6.7	2.5	0.17	25	0 25.6	4 38 39.24	21 12 25.8	15.7	5.9	0.43
10	0 7.9	1 23 24.31	8 8 30.1	6.7	2.5	0.17	26	0 19.8	4 36 47.63	20 51 7.0	15.9	6.0	0.43
11	0 11.6	1 31 4.23	9 4 29.5	6.7	2.5	0.17	27	0 13.9	4 34 48.01	20 29 31.6	16.0	6.0	0.43
12	0 15.3	1 38 47.59	+10 0 17.0	6.7	2.5	0.17	28	0 7.9	4 32 42.56	+20 7 52.3	16.1	6.0	0.44
13	0 19.1	1 46 33.85	10 55 41.2	6.8	2.6	0.18	29	0 1.9	4 30 33.58	19 46 22.6	16.1	6.1	0.44
14	0 23.0	1 54 22.33	11 50 29.9	6.8	2.6	0.18	29	23 55.8	4 28 23.39	19 25 16.2	16.1	6.1	0.43
15	0 26.9	2 2 12.20	12 44 30.5	6.9	2.6	0.18	30	23 49.7	4 26 14.27	19 4 47.0	16.1	6.1	0.43
16	0 30.8	2 10 2.55	13 37 30.1	7.0	2.6	0.18	31	23 43.7	4 24 8.47	18 45 8.7	16.0	6.0	0.43
17	0 34.6	2 17 52.35	+14 29 15.7	7.1	2.7	0.19	June 1	23 37.7	4 22 8.11	+18 26 33.7	15.9	6.0	0.42
18	0 38.5	2 25 40.48	15 19 34.5	7.2	2.7	0.19	2	23 31.9	4 20 15.21	18 9 14.1	15.8	6.0	0.42
19	0 42.3	2 33 25.78	16 8 14.3	7.3	2.7	0.19	3	23 26.2	4 18 31.62	17 53 20.9	15.7	5.9	0.42
20	0 46.1	2 41 7.00	16 55 3.9	7.4	2.8	0.20	4	23 20.7	4 16 59.03	17 39 3.9	15.5	5.9	0.41
21	0 49.7	2 48 42.90	17 39 53.2	7.5	2.8	0.20	5	23 15.5	4 15 38.93	17 26 31.0	15.3	5.8	0.40
22	0 53.2	2 56 12.26	+18 22 33.5	7.6	2.9	0.20	6	23 10.5	4 14 32.57	+17 15 48.3	15.1	5.7	0.40
23	0 56.6	3 3 33.67	19 2 57.1	7.8	2.9	0.21	7	23 5.7	4 13 41.03	17 7 0.7	14.9	5.6	0.39
24	0 59.9	3 10 46.55	19 40 58.1	8.0	3.0	0.21	8	23 1.1	4 13 5.23	17 0 11.5	14.7	5.5	0.39
25	1 3.1	3 17 49.18	20 16 32.1	8.1	3.0	0.22	9	22 56.9	4 12 45.87	16 55 22.7	14.4	5.4	0.38
26	1 6.0	3 24 40.73	20 49 36.3	8.3	3.1	0.22	10	22 53.0	4 12 43.52	16 52 34.6	14.1	5.3	0.37
27	1 8.7	3 31 20.24	+21 20 8.8	8.5	3.2	0.23	11	22 49.3	4 12 58.58	+16 51 46.4	13.8	5.2	0.37
28	1 11.2	3 37 46.78	21 48 9.1	8.7	3.2	0.23	12	22 45.9	4 13 31.36	16 52 55.6	13.5	5.1	0.36
29	1 13.4	3 43 59.51	22 13 37.8	8.9	3.3	0.24	13	22 42.8	4 14 22.04	16 55 59.3	13.2	5.0	0.35
30	1 15.4	3 49 57.64	22 36 36.1	9.1	3.4	0.24	14	22 40.0	4 15 30.73	17 0 53.8	12.9	4.9	0.34
May 1	1 17.2	3 55 40.46	22 57 6.3	9.3	3.5	0.25	15	22 37.5	4 16 57.49	17 7 34.3	12.6	4.8	0.34
2	1 18.7	4 1 7.28	+23 15 10.9	9.5	3.6	0.26	16	22 35.3	4 18 42.29	+17 15 55.4	12.3	4.7	0.33
3	1 19.9	4 6 17.44	23 30 52.5	9.8	3.7	0.26	17	22 33.4	4 20 45.09	17 25 51.5	12.0	4.6	0.32
4	1 20.9	4 11 10.38	23 44 14.5	10.0	3.8	0.27	18	22 31.8	4 23 5.82	17 37 16.2	11.7	4.5	0.32
5	1 21.5	4 15 45.53	23 55 20.2	10.2	3.9	0.28	19	22 30.5	4 25 44.42	17 50 3.0	11.5	4.4	0.31
6	1 21.8	4 20 2.35	24 4 13.3	10.5	4.0	0.29	20	22 29.5	4 28 40.80	18 4 4.8	11.2	4.3	0.30
7	1 21.8	4 24 0.36	+24 10 57.0	10.8	4.1	0.30	21	22 28.8	4 31 54.88	+18 19 14.3	11.0	4.2	0.29
8	1 21.5	4 27 39.09	24 15 35.1	11.1	4.2	0.30	22	22 28.4	4 35 26.62	18 35 24.0	10.7	4.1	0.29
9	1 20.9	4 30 58.11	24 18 10.8	11.4	4.3	0.31	23	22 28.3	4 39 15.98	18 52 26.3	10.5	4.0	0.28
10	1 20.0	4 33 57.04	24 18 47.7	11.7	4.4	0.32	24	22 28.5	4 43 22.90	19 10 13.0	10.2	3.9	0.27
11	1 18.7	4 36 35.53	24 17 28.8	12.0	4.5	0.33	25	22 29.0	4 47 47.36	19 28 35.8	10.0	3.8	0.27
12	1 17.0	4 38 53.34	+24 14 17.5	12.3	4.6	0.34	26	22 29.7	4 52 29.35	+19 47 26.2	9.7	3.7	0.26
13	1 15.1	4 40 50.25	24 9 17.1	12.6	4.7	0.35	27	22 30.7	4 57 28.88	20 6 35.0	9.5	3.6	0.26
14	1 12.7	4 42 26.15	24 2 30.8	12.9	4.9	0.35	28	22 32.1	5 2 45.96	20 25 53.0	9.3	3.5	0.25
15	1 10.0	4 43 41.05	23 54 2.2	13.2	5.0	0.36	29	22 33.7	5 8 20.58	20 45 10.6	9.1	3.4	0.25
16	1 6.9	4 44 35.06	23 43 54.9	13.5	5.1	0.37	30	22 35.6	5 14 12.72	21 4 17.6	8.9	3.3	0.24
17	1 3.6	4 45 8.43	+23 32 12.6	13.8	5.2	0.38	31	22 37.8	5 20 22.33	+21 23 3.5	8.7	3.3	0.24
18	0 59.9	4 45 21.55	+23 18 59.5	14.1	5.3	0.39	32	22 40.3	5 26 49.32	+21 41 17.4	8.5	3.2	0.23

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
July 1	22 37.8	5 20 22.33	+21 23 3.5	8.7	3.3	0.24	Aug. 17	1 27.7	11 12 1.18	+5 15 31.4	7.5	2.8	0.19
2	22 40.3	5 26 49.32	21 41 17.4	8.5	3.2	0.23	18	1 29.0	11 17 16.31	4 33 15.2	7.6	2.9	0.19
3	22 43.1	5 33 33.52	21 58 47.9	8.3	3.1	0.23	19	1 30.1	11 22 24.90	3 51 17.4	7.7	2.9	0.19
4	22 46.2	5 40 34.70	22 15 23.2	8.2	3.1	0.22	20	1 31.2	11 27 27.01	3 9 40.7	7.8	2.9	0.19
5	22 49.5	5 47 52.50	22 30 51.2	8.0	3.0	0.22	21	1 32.2	11 32 22.70	2 28 27.8	7.9	3.0	0.19
6	22 53.1	5 55 26.45	+22 44 59.5	7.9	2.9	0.21	22	1 33.1	11 37 11.99	+1 47 41.5	8.0	3.0	0.20
7	22 57.0	6 3 15.95	22 57 36.0	7.7	2.9	0.21	23	1 33.9	11 41 54.85	1 7 24.5	8.1	3.1	0.20
8	23 1.1	6 11 20.22	23 8 28.7	7.6	2.8	0.21	24	1 34.5	11 46 31.24	+0 27 39.7	8.1	3.1	0.20
9	23 5.6	6 19 38.31	23 17 25.4	7.4	2.8	0.20	25	1 35.1	11 51 1.10	−0 11 30.0	8.2	3.1	0.20
10	23 10.2	6 28 9.08	23 24 15.2	7.3	2.8	0.20	26	1 35.6	11 55 24.32	0 50 1.7	8.3	3.2	0.21
11	23 14.9	6 36 51.24	+23 28 47.8	7.2	2.7	0.20	27	1 35.9	11 59 40.75	−1 27 52.4	8.4	3.2	0.21
12	23 19.8	6 45 43.29	23 30 54.1	7.1	2.7	0.20	28	1 36.1	12 3 50.24	2 4 58.9	8.6	3.3	0.22
13	23 24.8	6 54 43.60	23 30 26.6	7.0	2.7	0.19	29	1 36.2	12 7 52.57	2 41 17.6	8.7	3.3	0.22
14	23 29.9	7 3 50.41	23 27 19.6	6.9	2.6	0.19	30	1 36.2	12 11 47.46	3 16 45.0	8.8	3.3	0.22
15	23 35.1	7 13 1.95	23 21 29.1	6.9	2.6	0.19	31	1 36.1	12 15 34.60	3 51 17.2	9.0	3.4	0.23
16	23 40.4	7 22 16.37	+23 12 53.3	6.8	2.6	0.19	Sept. 1	1 35.8	12 19 13.64	−4 24 50.1	9.1	3.4	0.23
17	23 45.7	7 31 31.83	23 1 32.4	6.8	2.6	0.19	2	1 35.4	12 22 44.20	4 57 19.4	9.2	3.5	0.24
18	23 51.0	7 40 46.55	22 47 28.4	6.7	2.5	0.19	3	1 34.8	12 26 5.78	5 28 40.2	9.3	3.5	0.24
19	23 56.3	7 49 58.90	22 30 45.1	6.7	2.5	0.18	4	1 34.0	12 29 17.87	5 58 47.4	9.5	3.6	0.24
21	0 1.5	7 59 7.36	22 11 28.0	6.6	2.5	0.18	5	1 33.1	12 32 19.86	6 27 35.3	9.6	3.6	0.25
22	0 6.6	8 8 10.57	+21 49 44.0	6.6	2.5	0.18	6	1 32.0	12 35 11.12	−6 54 57.6	9.8	3.7	0.25
23	0 11.5	8 17 7.37	21 25 40.7	6.6	2.5	0.18	7	1 30.7	12 37 50.88	7 20 47.3	10.0	3.7	0.26
24	0 16.4	8 25 56.76	20 59 26.5	6.6	2.5	0.18	8	1 29.2	12 40 18.33	7 44 57.0	10.2	3.8	0.26
25	0 21.2	8 34 37.93	20 31 10.4	6.6	2.5	0.18	9	1 27.5	12 42 32.61	8 7 18.9	10.4	3.9	0.26
26	0 25.8	8 43 10.24	20 1 1.7	6.6	2.5	0.18	10	1 25.6	12 44 32.75	8 27 44.0	10.6	3.9	0.27
27	0 30.2	8 51 33.19	+19 29 9.5	6.6	2.5	0.18	11	1 23.4	12 46 17.75	−8 46 2.5	10.8	4.0	0.27
28	0 34.4	8 59 46.47	18 55 42.9	6.6	2.5	0.18	12	1 21.0	12 47 46.50	9 2 3.8	11.0	4.1	0.28
29	0 38.5	9 7 49.86	18 20 50.7	6.6	2.5	0.18	13	1 18.2	12 48 57.86	9 15 36.4	11.2	4.2	0.28
30	0 42.4	9 15 43.24	17 44 41.6	6.6	2.5	0.18	14	1 15.1	12 49 50.65	9 26 28.2	11.4	4.3	0.29
31	0 46.2	9 23 26.60	17 7 23.7	6.7	2.5	0.18	15	1 11.7	12 50 23.70	9 34 26.2	11.6	4.3	0.29
Aug. 1	0 49.8	9 31 0.01	+16 29 4.7	6.7	2.5	0.18	16	1 8.0	12 50 35.83	−9 39 16.4	11.8	4.4	0.30
2	0 53.3	9 38 23.57	15 49 51.8	6.7	2.5	0.18	17	1 3.9	12 50 25.99	9 40 44.9	12.0	4.5	0.30
3	0 56.6	9 45 37.45	15 9 51.8	6.8	2.5	0.18	18	0 59.4	12 49 53.20	9 38 37.7	12.3	4.6	0.31
4	0 59.7	9 52 41.84	14 29 10.9	6.8	2.5	0.18	19	0 54.6	12 48 56.73	9 32 41.2	12.5	4.7	0.31
5	1 2.6	9 59 36.97	13 47 55.0	6.8	2.6	0.18	20	0 49.4	12 47 36.13	9 22 43.3	12.7	4.8	0.32
6	1 5.4	10 6 23.05	+13 6 9.9	6.9	2.6	0.18	21	0 43.7	12 45 51.33	−9 8 34.1	12.9	4.9	0.33
7	1 8.1	10 13 0.35	12 24 0.6	6.9	2.6	0.18	22	0 37.6	12 43 42.76	8 50 6.8	13.1	4.9	0.33
8	1 10.6	10 19 29.11	11 41 31.9	7.0	2.6	0.18	23	0 31.1	12 41 11.51	8 27 19.3	13.2	5.0	0.34
9	1 13.0	10 25 49.58	10 58 48.2	7.0	2.6	0.18	24	0 24.3	12 38 19.32	8 0 15.6	13.3	5.0	0.34
10	1 15.3	10 32 1.98	10 15 53.6	7.1	2.7	0.18	25	0 17.3	12 35 8.69	7 29 7.2	13.4	5.0	0.34
11	1 17.4	10 38 6.56	+ 9 32 51.9	7.1	2.7	0.19	26	0 9.9	12 31 43.02	−6 54 14.1	13.4	5.1	0.34
12	1 19.4	10 44 3.57	8 49 47.0	7.2	2.7	0.19	27	0 2.4	12 28 6.48	6 16 5.8	13.5	5.1	0.34
13	1 21.3	10 49 53.17	8 6 42.6	7.2	2.7	0.19	27	23 54.8	12 24 24.01	5 35 21.1	13.5	5.1	0.34
14	1 23.1	10 55 35.55	7 23 41.8	7.3	2.8	0.19	28	23 47.1	12 20 41.06	4 52 47.4	13.4	5.0	0.33
15	1 24.8	11 1 10.92	6 40 47.5	7.4	2.8	0.19	29	23 39.5	12 17 3.58	4 9 19.8	13.3	5.0	0.33
16	1 26.3	11 6 39.42	+ 5 58 3.0	7.5	2.8	0.19	30	23 32.2	12 13 37.63	−3 25 57.4	13.1	4.9	0.33
17	1 27.7	11 12 1.18	+ 5 15 31.4	7.5	2.8	0.19	31	23 25.1	12 10 29.08	−2 43 41.7	12.9	4.9	0.32

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	23 25.1	12 10 29.08	− 2 43 41.7	12.9	4.9	0.32	Nov. 16	23 46.1	15 32 51.79	−19 31 57.5	6.1	2.3	0.16
2	23 18.4	12 7 43.40	2 3 32.6	12.7	4.8	0.32	17	23 48.6	15 39 18.30	20 0 33.7	6.1	2.3	0.16
3	23 12.2	12 5 25.40	1 26 25.3	12.4	4.7	0.31	18	23 51.1	15 45 46.26	20 28 10.7	6.1	2.3	0.16
4	23 6.5	12 3 39.06	0 53 8.0	12.1	4.6	0.30	19	23 53.6	15 52 15.73	20 54 47.0	6.1	2.3	0.16
5	23 1.4	12 2 27.30	0 24 20.5	11.8	4.4	0.30	20	23 56.2	15 58 46.72	21 20 21.3	6.1	2.3	0.17
6	22 56.9	12 1 52.06	− 0 0 33.1	11.5	4.3	0.29	21	23 58.8	16 5 19.27	−21 44 52.3	6.1	2.3	0.17
7	22 53.0	12 1 54.29	+ 0 17 54.7	11.2	4.2	0.28	23	0 1.4	16 11 53.40	22 8 18.4	6.1	2.3	0.17
8	22 49.7	12 2 33.95	0 30 52.4	10.9	4.1	0.27	24	0 4.1	16 18 29.15	22 30 38.2	6.1	2.3	0.17
9	22 47.1	12 3 50.19	0 38 18.4	10.5	4.0	0.26	25	0 6.8	16 25 6.48	22 51 50.3	6.1	2.3	0.17
10	22 45.0	12 5 41.47	0 40 18.3	10.2	3.8	0.26	26	0 9.5	16 31 45.40	23 11 53.3	6.1	2.3	0.17
11	22 43.4	12 8 5.71	+ 0 37 4.2	9.8	3.7	0.25	27	0 12.2	16 38 25.90	−23 30 45.8	6.2	2.3	0.17
12	22 42.3	12 11 0.48	0 28 52.6	9.5	3.6	0.24	28	0 14.9	16 45 7.95	23 48 26.4	6.2	2.3	0.17
13	22 41.8	12 14 23.07	+ 0 16 3.8	9.3	3.5	0.24	29	0 17.7	16 51 51.50	24 4 53.6	6.2	2.3	0.17
14	22 41.7	12 18 10.68	− 0 0 59.9	9.0	3.4	0.23	30	0 20.5	16 58 36.47	24 20 6.0	6.2	2.3	0.17
15	22 41.9	12 22 20.51	0 21 54.3	8.8	3.4	0.22	Dec. 1	0 23.3	17 5 22.80	24 34 2.2	6.3	2.4	0.17
16	22 42.4	12 26 49.85	− 0 46 15.2	8.5	3.3	0.22	2	0 26.1	17 12 10.38	−24 46 40.6	6.3	2.4	0.17
17	22 43.2	12 31 36.14	1 13 38.7	8.3	3.2	0.21	3	0 29.0	17 18 59.09	24 58 0.0	6.3	2.4	0.18
18	22 44.3	12 36 36.99	1 43 41.5	8.1	3.1	0.21	4	0 31.9	17 25 48.79	25 7 59.0	6.4	2.4	0.18
19	22 45.6	12 41 50.26	2 16 1.4	8.0	3.0	0.20	5	0 34.8	17 32 39.31	25 16 36.1	6.4	2.4	0.18
20	22 47.1	12 47 14.03	2 50 18.2	7.8	2.9	0.20	6	0 37.7	17 39 30.46	25 23 49.8	6.5	2.4	0.18
21	22 48.7	12 52 46.62	− 3 26 12.6	7.6	2.9	0.20	7	0 40.6	17 46 22.02	−25 29 39.2	6.5	2.5	0.18
22	22 50.4	12 58 26.53	4 3 27.2	7.5	2.8	0.19	8	0 43.5	17 53 13.72	25 34 2.9	6.6	2.5	0.18
23	22 52.2	13 4 12.52	4 41 46.6	7.4	2.8	0.19	9	0 46.4	18 0 5.29	25 36 59.7	6.6	2.5	0.18
24	22 54.1	13 10 3.54	5 20 56.4	7.2	2.7	0.19	10	0 49.3	18 6 56.40	25 38 28.4	6.7	2.5	0.19
25	22 56.1	13 15 58.67	6 0 44.3	7.1	2.7	0.18	11	0 52.2	18 13 46.68	25 38 28.1	6.7	2.6	0.19
26	22 58.1	13 21 57.17	− 6 40 59.0	7.0	2.7	0.18	12	0 55.0	18 20 35.69	−25 36 58.4	6.8	2.6	0.19
27	23 0.1	13 27 58.46	7 21 30.9	6.9	2.6	0.18	13	0 57.9	18 27 22.95	25 33 58.4	6.9	2.6	0.19
28	23 2.2	13 34 2.03	8 2 11.0	6.8	2.6	0.18	14	1 0.7	18 34 7.92	25 29 27.6	7.0	2.6	0.20
29	23 4.4	13 40 7.48	8 42 51.9	6.8	2.6	0.18	15	1 3.4	18 40 50.01	25 23 26.0	7.0	2.7	0.20
30	23 6.6	13 46 14.51	9 23 26.5	6.7	2.6	0.17	16	1 6.1	18 47 28.53	25 15 53.7	7.1	2.7	0.20
31	23 8.8	13 52 22.89	−10 3 49.0	6.6	2.5	0.17	17	1 8.8	18 54 2.71	−25 6 51.2	7.2	2.7	0.20
Nov. 1	23 11.0	13 58 32.43	10 43 54.2	6.6	2.5	0.17	18	1 11.3	19 0 31.66	24 56 19.6	7.3	2.8	0.21
2	23 13.2	14 4 43.01	11 23 37.0	6.5	2.5	0.17	19	1 13.7	19 6 54.40	24 44 20.3	7.4	2.8	0.21
3	23 15.5	14 10 54.53	12 2 53.4	6.5	2.5	0.17	20	1 16.0	19 13 9.84	24 30 55.3	7.6	2.9	0.21
4	23 17.7	14 17 6.93	12 41 39.9	6.4	2.5	0.17	21	1 18.2	19 19 16.71	24 16 7.4	7.7	2.9	0.22
5	23 20.0	14 23 20.20	−13 19 53.1	6.4	2.4	0.17	22	1 20.2	19 25 13.56	−24 0 0.2	7.8	3.0	0.22
6	23 22.3	14 29 34.35	13 57 30.0	6.3	2.4	0.16	23	1 22.0	19 30 58.79	23 42 38.4	8.0	3.1	0.22
7	23 24.6	14 35 49.39	14 34 27.8	6.3	2.4	0.16	24	1 23.6	19 36 30.62	23 24 7.5	8.2	3.1	0.23
8	23 26.9	14 42 5.35	15 10 44.1	6.3	2.4	0.16	25	1 25.0	19 41 47.03	23 4 34.1	8.4	3.2	0.23
9	23 29.2	14 48 22.26	15 46 16.6	6.2	2.4	0.16	26	1 26.0	19 46 45.77	22 44 6.6	8.6	3.2	0.23
10	23 31.6	14 54 40.16	−16 21 3.3	6.2	2.4	0.16	27	1 26.6	19 51 24.32	−22 22 54.7	8.8	3.3	0.24
11	23 33.9	15 0 59.11	16 55 2.1	6.2	2.3	0.16	28	1 26.9	19 55 39.91	22 1 9.6	9.0	3.4	0.24
12	23 36.3	15 7 19.18	17 28 11.3	6.2	2.3	0.16	29	1 26.8	19 59 29.55	21 39 4.1	9.3	3.5	0.25
13	23 38.7	15 13 40.42	18 0 29.0	6.2	2.3	0.16	30	1 26.2	20 2 50.06	21 16 52.9	9.5	3.6	0.25
14	23 41.1	15 20 2.89	18 31 53.6	6.1	2.3	0.16	31	1 25.1	20 5 38.05	20 54 52.1	9.7	3.7	0.26
15	23 43.6	15 26 26.66	−19 2 23.6	6.1	2.3	0.16	32	1 23.4	20 7 50.05	−20 33 19.5	10.0	3.8	0.27
16	23 46.1	15 32 51.79	−19 31 57.5	6.1	2.3	0.16	33	1 21.0	20 9 22.64	−20 12 33.6	10.4	3.9	0.28

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Jan. 0	23 14.0	17 59 7.96	−23 24 50.7	5.3	5.1	0.37
1	23 15.6	18 4 37.13	23 27 3.9	5.3	5.1	0.37
2	23 17.2	18 10 6.44	23 28 33.6	5.3	5.1	0.37
3	23 18.7	18 15 35.85	23 29 19.6	5.3	5.1	0.37
4	23 20.3	18 21 5.27	23 29 21.9	5.3	5.1	0.37
5	23 21.8	18 26 34.67	−23 28 40.6	5.3	5.1	0.37
6	23 23.3	18 32 3.98	23 27 15.6	5.3	5.1	0.37
7	23 24.8	18 37 33.14	23 25 6.9	5.3	5.1	0.37
8	23 26.4	18 43 2.07	23 22 14.6	5.3	5.1	0.37
9	23 27.9	18 48 30.74	23 18 38.8	5.3	5.1	0.37
10	23 29.4	18 53 59.08	−23 14 19.6	5.3	5.1	0.37
11	23 30.9	18 59 27.03	23 9 17.2	5.3	5.1	0.37
12	23 32.4	19 4 54.52	23 3 31.9	5.3	5.1	0.37
13	23 33.9	19 10 21.51	22 57 3.9	5.2	5.1	0.37
14	23 35.4	19 15 47.94	22 49 53.4	5.2	5.1	0.37
15	23 36.9	19 21 13.75	−22 42 0.6	5.2	5.1	0.37
16	23 38.4	19 26 38.89	22 33 26.0	5.2	5.1	0.37
17	23 39.9	19 32 3.29	22 24 9.9	5.2	5.1	0.36
18	23 41.4	19 37 26.92	22 14 12.7	5.2	5.1	0.36
19	23 42.8	19 42 49.72	22 3 34.8	5.2	5.0	0.36
20	23 44.2	19 48 11.63	−21 52 16.7	5.2	5.0	0.36
21	23 45.6	19 53 32.63	21 40 18.8	5.2	5.0	0.36
22	23 47.0	19 58 52.68	21 27 41.7	5.2	5.0	0.36
23	23 48.4	20 4 11.73	21 14 25.8	5.2	5.0	0.36
24	23 49.8	20 9 29.74	21 0 31.8	5.2	5.0	0.36
25	23 51.1	20 14 46.68	−20 46 0.1	5.2	5.0	0.36
26	23 52.4	20 20 2.53	20 30 51.3	5.2	5.0	0.36
27	23 53.7	20 25 17.25	20 15 6.2	5.2	5.0	0.36
28	23 55.0	20 30 30.81	19 58 45.3	5.2	5.0	0.36
29	23 56.2	20 35 43.19	19 41 49.2	5.2	5.0	0.36
30	23 57.5	20 40 54.39	−19 24 18.6	5.2	5.0	0.35
31	23 58.7	20 46 4.39	19 6 14.2	5.2	5.0	0.35
Feb. 1	23 59.8	20 51 13.17	18 47 36.6	5.2	5.0	0.35
3	0 1.0	20 56 20.73	18 28 26.6	5.2	5.0	0.35
4	0 2.2	21 1 27.06	18 8 44.8	5.2	5.0	0.35
5	0 3.3	21 6 32.16	−17 48 31.8	5.2	5.0	0.35
6	0 4.4	21 11 36.02	17 27 48.4	5.2	5.0	0.35
7	0 5.5	21 16 38.65	17 6 35.5	5.2	5.0	0.35
8	0 6.6	21 21 40.05	16 44 53.6	5.2	5.0	0.35
9	0 7.7	21 26 40.23	16 22 43.5	5.2	5.0	0.35
10	0 8.7	21 31 39.20	−16 0 6.0	5.2	5.0	0.35
11	0 9.7	21 36 36.96	15 37 1.8	5.2	5.0	0.35
12	0 10.7	21 41 33.53	15 13 31.6	5.2	5.0	0.34
13	0 11.6	21 46 28.92	14 49 36.2	5.2	5.0	0.34
14	0 12.6	21 51 23.14	14 25 16.4	5.2	5.0	0.34
15	0 13.5	21 56 16.20	−14 0 32.9	5.2	5.0	0.34
16	0 14.5	22 1 8.12	−13 35 26.5	5.2	5.0	0.34
Feb. 16	0 14.5	22 1 8.12	−13 35 26.5	5.2	5.0	0.34
17	0 15.4	22 5 58.92	13 9 58.0	5.2	5.0	0.34
18	0 16.3	22 10 48.63	12 44 8.2	5.2	5.0	0.34
19	0 17.2	22 15 37.27	12 17 57.8	5.2	5.0	0.34
20	0 18.1	22 20 24.86	11 51 27.7	5.2	5.0	0.34
21	0 18.9	22 25 11.41	−11 24 38.5	5.2	5.0	0.34
22	0 19.7	22 29 56.95	10 57 31.1	5.2	5.0	0.34
23	0 20.5	22 34 41.50	10 30 6.2	5.2	5.0	0.34
24	0 21.3	22 39 25.12	10 2 24.7	5.2	5.0	0.34
25	0 22.1	22 44 7.84	9 34 27.3	5.2	5.0	0.34
26	0 22.9	22 48 49.66	− 9 6 14.8	5.2	5.0	0.34
27	0 23.6	22 53 30.63	8 37 48.0	5.2	5.0	0.34
28	0 24.3	22 58 10.78	8 9 7.6	5.2	5.0	0.34
Mar. 1	0 25.0	23 2 50.14	7 40 14.3	5.2	5.0	0.34
2	0 25.6	23 7 28.77	7 11 9.0	5.2	5.0	0.34
3	0 26.3	23 12 6.69	− 6 41 52.4	5.2	5.0	0.33
4	0 27.0	23 16 43.95	6 12 25.2	5.2	5.0	0.33
5	0 27.6	23 21 20.58	5 42 48.2	5.2	5.0	0.33
6	0 28.3	23 25 56.63	5 13 2.1	5.2	5.0	0.33
7	0 28.9	23 30 32.15	4 43 7.6	5.2	5.0	0.33
8	0 29.6	23 35 7.17	− 4 13 5.5	5.2	5.0	0.33
9	0 30.2	23 39 41.73	3 42 56.5	5.2	5.0	0.33
10	0 30.9	23 44 15.88	3 12 41.3	5.2	5.0	0.33
11	0 31.5	23 48 49.66	2 42 20.7	5.2	5.0	0.33
12	0 32.1	23 53 23.12	2 11 55.4	5.2	5.0	0.33
13	0 32.7	23 57 56.29	− 1 41 26.1	5.2	5.0	0.33
14	0 33.3	0 2 29.21	1 10 53.5	5.2	5.0	0.33
15	0 33.9	0 7 1.94	0 40 18.4	5.2	5.0	0.33
16	0 34.5	0 11 34.51	− 0 9 41.5	5.2	5.0	0.33
17	0 35.1	0 16 6.97	+ 0 20 56.5	5.2	5.0	0.33
18	0 35.7	0 20 39.36	+ 0 51 34.9	5.2	5.0	0.33
19	0 36.3	0 25 11.72	1 22 12.8	5.2	5.0	0.33
20	0 36.9	0 29 44.09	1 52 49.5	5.2	5.0	0.33
21	0 37.5	0 34 16.52	2 23 24.3	5.2	5.0	0.34
22	0 38.1	0 38 49.02	2 53 56.5	5.2	5.0	0.34
23	0 38.7	0 43 21.64	+ 3 24 25.3	5.2	5.0	0.34
24	0 39.3	0 47 54.45	3 54 50.0	5.2	5.0	0.34
25	0 39.9	0 52 27.47	4 25 9.8	5.2	5.0	0.34
26	0 40.5	0 57 0.76	4 55 23.9	5.2	5.0	0.34
27	0 41.1	1 1 34.33	5 25 31.7	5.2	5.0	0.34
28	0 41.7	1 6 8.24	+ 5 55 32.4	5.2	5.1	0.34
29	0 42.4	1 10 42.51	6 25 25.3	5.2	5.1	0.34
30	0 43.0	1 15 17.20	6 55 9.6	5.2	5.1	0.34
31	0 43.7	1 19 52.34	7 24 44.7	5.3	5.1	0.34
32	0 44.3	1 24 27.98	7 54 9.8	5.3	5.1	0.34
33	0 45.0	1 29 4.15	+ 8 23 24.1	5.3	5.1	0.34
34	0 45.7	1 33 40.89	+ 8 52 26.8	5.3	5.1	0.34

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	0 44.3	1 24 27.98	+ 7 54 9.8	5.3	5.1	0.34	May 17	1 30.2	5 11 52.39	+23 54 54.4	5.7	5.5	0.40
2	0 45.0	1 29 4.15	8 23 24.1	5.3	5.1	0.34	18	1 31.6	5 17 10.72	24 2 57.3	5.7	5.6	0.41
3	0 45.7	1 33 40.89	8 52 26.8	5.3	5.1	0.34	19	1 32.9	5 22 29.55	24 10 18.7	5.8	5.6	0.41
4	0 46.4	1 38 18.24	9 21 17.2	5.3	5.1	0.34	20	1 34.3	5 27 48.84	24 16 58.0	5.8	5.6	0.41
5	0 47.1	1 42 56.24	9 49 54.7	5.3	5.1	0.34	21	1 35.7	5 33 8.51	24 22 55.1	5.8	5.6	0.41
6	0 47.8	1 47 34.93	+10 18 18.5	5.3	5.1	0.35	22	1 37.1	5 38 28.51	+24 28 9.7	5.8	5.6	0.41
7	0 48.5	1 52 14.35	10 46 27.9	5.3	5.1	0.35	23	1 38.5	5 43 48.78	24 32 41.7	5.8	5.6	0.41
8	0 49.2	1 56 54.52	11 14 22.1	5.3	5.1	0.35	24	1 39.9	5 49 9.25	24 36 30.8	5.8	5.6	0.41
9	0 49.9	2 1 35.49	11 42 0.4	5.3	5.1	0.35	25	1 41.3	5 54 29.85	24 39 36.9	5.9	5.7	0.42
10	0 50.7	2 6 17.29	12 9 22.0	5.3	5.1	0.35	26	1 42.7	5 59 50.53	24 41 59.8	5.9	5.7	0.42
11	0 51.4	2 10 59.94	+12 36 26.2	5.3	5.1	0.35	27	1 44.1	6 5 11.23	+24 43 39.4	5.9	5.7	0.42
12	0 52.2	2 15 43.48	13 3 12.3	5.3	5.1	0.35	28	1 45.5	6 10 31.88	24 44 35.8	5.9	5.7	0.42
13	0 53.0	2 20 27.94	13 29 39.5	5.3	5.2	0.35	29	1 46.9	6 15 52.41	24 44 48.7	5.9	5.7	0.42
14	0 53.8	2 25 13.33	13 55 47.1	5.3	5.2	0.35	30	1 48.3	6 21 12.74	24 44 18.3	6.0	5.7	0.42
15	0 54.6	2 29 59.68	14 21 34.3	5.3	5.2	0.36	31	1 49.7	6 26 32.82	24 43 4.6	6.0	5.8	0.42
16	0 55.5	2 34 47.02	+14 47 0.3	5.4	5.2	0.36	June 1	1 51.1	6 31 52.59	+24 41 7.8	6.0	5.8	0.43
17	0 56.3	2 39 35.37	15 12 4.5	5.4	5.2	0.36	2	1 52.5	6 37 12.00	24 38 27.9	6.0	5.8	0.43
18	0 57.2	2 44 24.74	15 36 46.0	5.4	5.2	0.36	3	1 53.8	6 42 30.96	24 35 5.0	6.1	5.8	0.43
19	0 58.1	2 49 15.17	16 1 4.1	5.4	5.2	0.36	4	1 55.2	6 47 49.43	24 30 59.3	6.1	5.8	0.43
20	0 59.0	2 54 6.65	16 24 57.9	5.4	5.2	0.36	5	1 56.5	6 53 7.36	24 26 11.0	6.1	5.8	0.43
21	0 59.9	2 58 59.20	+16 48 26.9	5.4	5.2	0.36	6	1 57.9	6 58 24.68	+24 20 40.3	6.1	5.9	0.43
22	1 0.9	3 3 52.84	17 11 30.2	5.4	5.2	0.36	7	1 59.2	7 3 41.34	24 14 27.5	6.1	5.9	0.43
23	1 1.8	3 8 47.56	17 34 7.0	5.4	5.2	0.37	8	2 0.5	7 8 57.28	24 7 32.8	6.2	5.9	0.43
24	1 2.8	3 13 43.38	17 56 16.5	5.4	5.2	0.37	9	2 1.8	7 14 12.45	23 59 56.7	6.2	6.0	0.43
25	1 3.8	3 18 40.30	18 17 58.1	5.4	5.3	9.37	10	2 3.1	7 19 26.80	23 51 39.3	6.2	6.0	0.44
26	1 4.8	3 23 38.31	+18 39 11.2	5.5	5.3	0.37	11	2 4.4	7 24 40.28	+23 42 41.2	6.2	6.0	0.44
27	1 5.8	3 28 37.42	18 59 54.9	5.5	5.3	0.37	12	2 5.6	7 29 52.84	23 33 2.7	6.2	6.0	0.44
28	1 6.9	3 33 37.64	19 20 8.5	5.5	5.3	0.37	13	2 6.8	7 35 4.42	23 22 44.3	6.3	6.1	0.44
29	1 8.0	3 38 38.96	19 39 51.2	5.5	5.3	0.37	14	2 8.0	7 40 14.97	23 11 46.4	6.3	6.1	0.44
30	1 9.1	3 43 41.37	19 59 2.5	5.5	5.3	0.38	15	2 9.2	7 45 24.46	23 0 9.3	6.3	6.1	0.44
May 1	1 10.2	3 48 44.86	+20 17 41.6	5.5	5.3	0.38	16	2 10.4	7 50 32.85	+22 47 53.5	6.4	6.1	0.44
2	1 11.3	8 53 49.42	20 35 47.8	5.5	5.3	0.38	17	2 11.6	7 55 40.10	22 34 59.6	6.4	6.2	0.44
3	1 12.4	3 58 55.05	20 53 20.5	5.5	5.4	0.38	18	2 12.8	8 0 46.16	22 21 28.1	6.4	6.2	0.45
4	1 13.6	4 4 1.73	21 10 19.2	5.5	5.4	0.38	19	2 13.9	8 5 50.99	22 7 19.7	6.4	6.2	0.45
5	1 14.8	4 9 9.43	21 26 43.2	5.6	5.4	0.38	20	2 15.0	8 10 54.57	21 52 34.8	6.4	6.2	0.45
6	1 16.0	4 14 18.14	+21 42 31.8	5.6	5.4	0.39	21	2 16.1	8 15 56.86	+21 37 14.0	6.5	6.3	0.45
7	1 17.2	4 19 27.84	21 57 44.4	5.6	5.4	0.39	22	2 17.2	8 20 57.83	21 21 18.1	6.5	6.3	0.45
8	1 18.4	4 24 38.50	22 12 20.4	5.6	5.4	0.39	23	2 18.3	8 25 57.46	21 4 47.4	6.5	6.3	0.45
9	1 19.7	4 29 50.10	22 26 19.3	5.6	5.4	0.39	24	2 19.4	8 30 55.72	20 47 42.7	6.6	6.3	0.45
10	1 21.0	4 35 2.61	22 39 40.6	5.6	5.4	0.39	25	2 20.4	8 35 52.59	20 30 4.6	6.6	6.4	0.45
11	1 22.3	4 40 16.00	+22 52 23.7	5.6	5.4	0.39	26	2 21.4	8 40 48.06	+20 11 53.8	6.6	6.4	0.46
12	1 23.6	4 45 30.23	23 4 28.2	5.6	5.5	0.40	27	2 22.4	8 45 42.09	19 53 11.2	6.7	6.4	0.46
13	1 24.9	4 50 45.24	23 15 53.6	5.7	5.5	0.40	28	2 23.3	8 50 34.69	19 33 57.4	6.7	6.5	0.46
14	1 26.2	4 56 1.01	23 26 39.3	5.7	5.5	0.40	29	2 24.2	8 55 25.84	19 14 12.8	6.7	6.5	0.46
15	1 27.5	5 1 17.48	23 36 45.0	5.7	5.5	0.40	30	2 25.1	9 0 15.54	18 53 58.3	6.8	6.5	0.46
16	1 28.9	5 6 34.63	+23 46 10.2	5.7	5.5	0.40	31	2 25.9	9 5 3.80	+18 33 14.5	6.8	6.6	0.46
17	1 30.2	5 11 52.39	+23 54 54.4	5.7	5.5	0.40	32	2 26.7	9 9 50.61	+18 12 2.1	6.8	6.6	0.46

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
July 1	2 25.9	9 5 3.80	+18 33 14.5	6.8	6.6	0.46	Aug. 16	2 43.7	12 24 22.78	− 2 45 6.4	9.1	8.8	0.59
2	2 26.7	9 9 50.61	18 12 2.1	6.8	6.6	0.46	17	2 43.8	12 28 24.04	3 15 42.0	9.2	8.8	0.59
3	2 27.5	9 14 35.97	17 50 21.9	6.9	6.6	0.46	18	2 43.9	12 32 24.97	3 46 14.4	9.2	8.9	0.60
4	2 28.3	9 19 19.89	17 28 14.6	6.9	6.7	0.47	19	2 44.0	12 36 25.57	4 16 43.1	9.3	9.0	0.60
5	2 29.1	9 24 2.38	17 5 40.7	6.9	6.7	0.47	20	2 44.0	12 40 25.88	4 47 7.2	9.4	9.1	0.61
6	2 29.8	9 28 43.43	+16 42 41.1	7.0	6.7	0.47	21	2 44.1	12 44 25.91	− 5 17 26.3	9.5	9.1	0.61
7	2 30.5	9 33 23.06	16 19 16.5	7.0	6.8	0.47	22	2 44.1	12 48 25.68	5 47 39.7	9.6	9.2	0.62
8	2 31.2	9 38 1.29	15 55 27.4	7.1	6.8	0.47	23	2 44.2	12 52 25.19	6 17 46.8	9.6	9.3	0.62
9	2 31.9	9 42 38.12	15 31 14.9	7.1	6.8	0.47	24	2 44.2	12 56 24.49	6 47 46.9	9.7	9.4	0.63
10	2 32.5	9 47 13.57	15 6 39.4	7.1	6.9	0.47	25	2 44.3	13 0 23.58	7 17 39.3	9.8	9.5	0.64
11	2 33.1	9 51 47.65	+14 41 41.7	7.2	6.9	0.48	26	2 44.3	13 4 22.48	− 7 47 23.5	9.9	9.5	0.64
12	2 33.7	9 56 20.39	14 16 22.5	7.2	7.0	0.48	27	2 44.3	13 8 21.20	8 16 58.9	10.0	9.6	0.65
13	2 34.3	10 0 51.81	13 50 42.5	7.3	7.0	0.48	28	2 44.4	13 12 19.75	8 46 24.7	10.0	9.7	0.65
14	2 34.9	10 5 21.92	13 24 42.4	7.3	7.0	0.48	29	2 44.4	13 16 18.15	9 15 40.3	10.1	9.8	0.66
15	2 35.4	10 9 50.74	12 58 22.9	7.3	7.1	0.48	30	2 44.4	13 20 16.42	9 44 45.3	10.2	9.9	0.67
16	2 35.9	10 14 18.29	+12 31 44.7	7.4	7.1	0.49	31	2 44.4	13 24 14.57	−10 13 39.0	10.3	10.0	0.68
17	2 36.4	10 18 44.60	12 4 48.6	7.4	7.2	0.49	Sept. 1	2 44.4	13 28 12.62	10 42 20.9	10.4	10.1	0.68
18	2 36.9	10 23 9.67	11 37 35.3	7.5	7.2	0.49	2	2 44.5	13 32 10.56	11 10 50.4	10.5	10.2	0.69
19	2 37.4	10 27 33.54	11 10 5.5	7.5	7.3	0.49	3	2 44.5	13 36 8.43	11 39 6.9	10.6	10.2	0.70
20	2 37.9	10 31 56.22	10 42 19.9	7.5	7.3	0.49	4	2 44.5	13 40 6.23	12 7 9.8	10.7	10.3	0.71
21	2 38.3	10 36 17.75	+10 14 19.2	7.6	7.3	0.50	5	2 44.5	13 44 3.96	−12 34 58.5	10.8	10.4	0.71
22	2 38.7	10 40 38.13	9 46 4.1	7.6	7.4	0.50	6	2 44.5	13 48 1.62	13 2 32.4	10.9	10.5	0.72
23	2 39.1	10 44 57.39	9 17 35.3	7.7	7.4	0.50	7	2 44.5	13 51 59.23	13 29 51.1	11.0	10.6	0.73
24	2 39.5	10 49 15.56	8 48 53.6	7.7	7.5	0.50	8	2 44.5	13 55 56.78	13 56 53.9	11.1	10.7	0.74
25	2 39.8	10 53 32.67	8 19 59.6	7.8	7.5	0.51	9	2 44.6	13 59 54.26	14 23 40.4	11.2	10.8	0.75
26	2 40.1	10 57 48.75	+ 7 50 54.1	7.8	7.6	0.51	10	2 44.6	14 3 51.67	−14 50 9.8	11.3	11.0	0.76
27	2 40.4	11 2 3.82	7 21 37.7	7.9	7.6	0.51	11	2 44.6	14 7 49.00	15 16 21.8	11.5	11.1	0.76
28	2 40.7	11 6 17.91	6 52 11.1	7.9	7.7	0.52	12	2 44.6	14 11 46.24	15 42 15.6	11.6	11.2	0.77
29	2 40.9	11 10 31.05	6 22 35.0	8.0	7.7	0.52	13	2 44.6	14 15 43.37	16 7 50.7	11.7	11.3	0.78
30	2 41.1	11 14 43.27	5 52 50.1	8.0	7.8	0.52	14	2 44.7	14 19 40.37	16 33 6.6	11.8	11.4	0.79
31	2 41.3	11 18 54.61	+ 5 22 57.0	8.1	7.8	0.52	15	2 44.7	14 23 37.21	−16 58 2.6	11.9	11.5	0.80
Aug. 1	2 41.6	11 23 5.11	4 52 56.3	8.2	7.9	0.53	16	2 44.7	14 27 33.86	17 22 38.2	12.1	11.6	0.81
2	2 41.8	11 27 14.79	4 22 48.8	8.2	7.9	0.53	17	2 44.7	14 31 30.29	17 46 52.6	12.2	11.8	0.82
3	2 42 0	11 31 23.68	3 52 35.1	8.3	8.0	0.53	18	2 44.7	14 35 26.45	18 10 45.5	12.3	11.9	0.83
4	2 42.2	11 35 31.81	3 22 15.8	8.3	8.0	0.54	19	2 44.7	14 39 22.30	18 34 16.4	12.4	12.0	0.85
5	2 42.4	11 39 39.23	+ 2 51 51.5	8.4	8.1	0.54	20	2 44.7	14 43 17.80	−18 57 24.6	12.6	12.2	0.86
6	2 42.6	11 43 45.96	2 21 23.0	8.4	8.1	0.54	21	2 44.6	14 47 12.90	19 20 9.6	12.7	12.3	0.87
7	2 42.8	11 47 52.04	1 50 50.7	8.5	8.2	0.55	22	2 44.6	14 51 7.55	19 42 30.8	12.9	12.4	0.88
8	2 42.9	11 51 57.50	1 20 15.2	8.6	8.2	0.55	23	2 44.6	14 55 1.71	20 4 27.6	13.0	12.6	0.89
9	2 43.0	11 56 2.39	0 49 37.3	8.6	8.3	0.55	24	2 44.5	14 58 55.30	20 25 59.6	13.2	12.7	0.91
10	2 43.1	12 0 6.73	+ 0 18 57.5	8.7	8.4	0.56	25	2 44.5	15 2 48.26	−20 47 6.2	13.3	12.9	0.92
11	2 43.2	12 4 10.55	− 0 11 43.7	8.8	8.4	0.56	26	2 44.4	15 6 40.52	21 7 46.9	13.5	13.0	0.93
12	2 43.3	12 8 13.88	0 42 25.5	8.8	8.5	0.57	27	2 44.4	15 10 32.02	21 28 1.3	13.6	13.2	0.94
13	2 43.4	12 12 16.74	1 13 7.3	8.9	8.6	0.57	28	2 44.3	15 14 22.68	21 47 48.9	13.8	13.3	0.96
14	2 43.5	12 16 19.16	1 43 48.5	8.9	8.6	0.58	29	2 44.2	15 18 12.44	22 7 9.3	14.0	13.5	0.97
15	2 43.6	12 20 21.16	− 2 14 28.4	9.0	8.7	0.58	30	2 44.1	15 22 1.21	−22 26 2.0	14.2	13.7	0.99
16	2 43.7	12 24 22.78	− 2 45 6.4	9.1	8.8	0.59	31	2 43.9	15 25 48.90	−22 44 27.0	14.3	13.9	1.00

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	2 43.9	15 25 48.90	−22 44 27.0	14.3	13.9	1.00	Nov.16	1 29.8	17 12 46.06	−27 13 16.9	28.8	27.9	2.08
2	2 43.7	15 29 35.43	23 2 23.7	14.5	14.0	1.02	17	1 25.2	17 12 10.05	27 4 33.5	29.3	28.3	2.11
3	2 43.5	15 33 20.69	23 19 51.7	14.7	14.2	1.03	18	1 20.4	17 11 23.41	26 55 2.5	29.7	28.7	2.13
4	2 43.3	15 37 4.60	23 36 50.8	14.9	14.4	1.05	19	1 15.5	17 10 26.26	26 44 43.2	30.1	29.0	2.16
5	2 43.1	15 40 47.03	23 53 20.4	15.1	14.6	1.06	20	1 10.5	17 9 18.78	26 33 34.9	30.5	29.4	2.18
6	2 42.8	15 44 27.89	−24 9 20.4	15.3	14.8	1.08	21	1 5.3	17 8 1.21	−26 21 37.1	30.8	29.8	2.21
7	2 42.5	15 48 7.07	24 24 50.5	15.5	15.0	1.09	22	0 59.9	17 6 33.91	26 8 49.6	31.2	30.1	2.23
8	2 42.2	15 51 44.42	24 39 50.5	15.7	15.2	1.11	23	0 54.4	17 4 57.35	25 55 12.4	31.5	30.4	2.25
9	2 41.8	15 55 19.83	24 54 20.0	15.9	15.4	1.13	24	0 48.7	17 3 12.04	25 40 46.2	31.8	30.7	2.26
10	2 41.4	15 58 53.14	25 8 18.8	16.1	15.6	1.15	25	0 42.9	17 1 18.61	25 25 32.2	32.1	31.0	2.28
11	2 41.0	16 2 24.20	−25 21 46.7	16.3	15.8	1.16	26	0 37.0	16 59 17.74	−25 9 31.9	32.4	31.3	2.29
12	2 40.5	16 5 52.86	25 34 43.4	16.6	16.0	1.18	27	0 31.0	16 57 10.22	24 52 47.1	32.6	31.5	2.30
13	2 40.0	16 9 18.94	25 47 8.8	16.8	16.3	1.20	28	0 24.8	16 54 56.91	24 35 20.4	32.8	31.7	2.31
14	2 39.5	16 12 42.28	25 59 2.6	17.1	16.5	1.22	29	0 18.5	16 52 38.73	24 17 15.0	33.0	31.9	2.32
15	2 38.9	16 16 2.67	26 10 24.7	17.3	16.8	1.24	30	0 12.2	16 50 16.65	23 58 34.6	33.2	32.0	2.33
16	2 38.3	16 19 19.94	−26 21 14.8	17.6	17.0	1.26	Dec. 1	0 5.9	16 47 51.72	−23 39 23.5	33.3	32.1	2.33
17	2 37.5	16 22 33.87	26 31 32.6	17.8	17.2	1.28	1	23 59.5	16 45 24.98	23 19 46.4	33.4	32.2	2.34
18	2 36.7	16 25 44.25	26 41 18.0	18.1	17.5	1.30	2	23 53.1	16 42 57.46	22 59 48.7	33.5	32.2	2.34
19	2 35.9	16 28 50.87	26 50 30.9	18.4	17.8	1.32	3	23 46.7	16 40 30.24	22 39 35.9	33.5	32.3	2.33
20	2 35.0	16 31 53.49	26 59 11.1	18.7	18.0	1.35	4	23 40.4	16 38 4.39	22 19 14.0	33.4	32.2	2.33
21	2 34.0	16 34 51.88	−27 7 18.5	19.0	18.3	1.37	5	23 34.1	16 35 40.91	−21 58 49.0	33.3	32.2	2.32
22	2 33.0	16 37 45.78	27 14 53.0	19.3	18.6	1.39	6	23 27.9	16 33 20.77	21 38 27.1	33.2	32.1	2.31
23	2 31.9	16 40 34.95	27 21 54.3	19.5	18.9	1.42	7	23 21.8	16 31 4.89	21 18 14.6	33.0	32.0	2.30
24	2 30.6	16 43 19.14	27 28 22.3	19.8	19.2	1.44	8	23 15.7	16 28 54.14	20 58 17.8	32.8	31.9	2.28
25	2 29.3	16 45 58.07	27 34 16.8	20.2	19.5	1.47	9	23 9.6	16 26 49.30	20 38 42.6	32.6	31.6	2.26
26	2 28.0	16 48 31.50	−27 39 37.7	20.5	19.8	1.49	10	23 3.7	16 24 51.10	−20 19 34.6	32.4	31.4	2.23
27	2 26.6	16 50 59.13	27 44 24.9	20.9	20.1	1.52	11	22 57.9	16 23 0.18	20 0 59.0	32.2	31.1	2.20
28	2 25.0	16 53 20.70	27 48 38.2	21.2	20.4	1.54	12	22 52.3	16 21 17.11	19 43 0.6	31.9	30.8	2.18
29	2 23.3	16 55 35.91	27 52 17.5	21.6	20.8	1.57	13	22 46.7	16 19 42.38	19 25 44.0	31.6	30.5	2.15
30	2 21.5	16 57 44.51	27 55 22.4	21.9	21.2	1.60	14	22 41.3	16 18 16.39	19 9 13.2	31.3	30.2	2.13
31	2 19.6	16 59 46.19	−27 57 52.7	22.3	21.5	1.62	15	22 36.1	16 16 59.49	−18 53 31.7	30.9	29.9	2.10
Nov. 1	2 17.6	17 1 40.69	27 59 48.2	22.6	21.9	1.65	16	22 31.0	16 15 51.95	18 38 42.1	30.6	29.5	2.07
2	2 15.5	17 3 27.71	28 1 8.7	23.0	22.2	1.68	17	22 26.1	16 14 54.00	18 24 46.9	30.2	29.2	2.04
3	2 13.1	17 5 6.95	28 1 53.7	23.4	22.6	1.71	18	22 21.4	16 14 5.77	18 11 47.9	29.8	28.8	2.01
4	2 10.7	17 6 38.12	28 2 2.8	23.8	23.0	1.74	19	22 16.9	16 13 27.32	17 59 46.5	29.4	28.4	1.98
5	2 8.2	17 8 0.94	−28 1 35.7	24.2	23.3	1.77	20	22 12.5	16 12 58.72	−17 48 43.6	29.0	28.0	1.95
6	2 5.4	17 9 15.12	28 0 31.6	24.6	23.7	1.80	21	22 8.3	16 12 39.97	17 38 39.5	28.5	27.5	1.92
7	2 2.6	17 10 20.37	27 58 49.9	25.0	24.1	1.82	22	22 4.2	16 12 31.00	17 29 34.3	28.1	27.1	1.89
8	1 59.7	17 11 16.42	27 56 30.2	25.4	24.5	1.85	23	22 0.2	16 12 31.75	17 21 27.5	27.6	26.7	1.86
9	1 56.6	17 12 3.02	27 53 31.6	25.8	24.9	1.88	24	21 56.4	16 12 42.09	17 14 18.4	27.2	26.3	1.83
10	1 53.2	17 12 39.89	−27 49 53.3	26.3	25.3	1.91	25	21 52.8	16 13 1.94	−17 8 5.9	26.7	25.9	1.80
11	1 49.7	17 13 6.82	27 45 34.4	26.7	25.8	1.94	26	21 49.3	16 13 31.05	17 2 48.9	26.3	25.4	1.77
12	1 46.0	17 13 23.61	27 40 34.0	27.1	26.2	1.97	27	21 46.1	16 14 9.27	16 58 25.5	25.9	25.0	1.74
13	1 42.2	17 13 30.07	27 34 51.3	27.5	26.6	2.00	28	21 43.0	16 14 56.39	16 54 54.5	25.4	24.6	1.72
14	1 38.3	17 13 26.03	27 28 24.9	28.0	27.0	2.03	29	21 40.0	16 15 52.21	16 52 13.5	25.0	24.2	1.68
15	1 34.2	17 13 11.38	−27 21 13.7	28.4	27.4	2.06	30	21 37.1	16 16 56.48	−16 50 20.7	24.6	23.8	1.66
16	1 29.8	17 12 46.06	−27 13 16.9	28.8	27.9	2.08	31	21 34.4	16 18 8.98	−16 49 13.8	24.2	23.4	1.63

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Jan. 1	19 8.5	13 56 52.37	−10 25 28.7	5.2	3.0	0.20
2	19 6.7	13 59 0.44	10 37 9.4	5.3	3.0	0.20
3	19 4.9	14 1 8.39	10 48 45.0	5.3	3.0	0.20
4	19 3.1	14 3 16.21	11 0 15.6	5.3	3.1	0.21
5	19 1.3	14 5 23.90	11 11 41.1	5.4	3.1	0.21
6	18 59.5	14 7 31.45	−11 23 1.4	5.4	3.1	0.21
7	18 57.7	14 9 38.87	11 34 16.5	5.4	3.1	0.21
8	18 55.9	14 11 46.13	11 45 26.3	5.5	3.1	0.21
9	18 54.0	14 13 53.25	11 56 30.7	5.5	3.2	0.21
10	18 52.2	14 16 0.21	12 7 29.8	5.5	3.2	0.22
11	18 50.4	14 18 7.01	−12 18 23.4	5.6	3.2	0.22
12	18 48.6	14 20 13.62	12 29 11.5	5.6	3.2	0.22
13	18 46.7	14 22 20.06	12 39 53.9	5.6	3.2	0.22
14	18 44.9	14 24 26.30	12 50 30.7	5.7	3.3	0.22
15	18 43.1	14 26 32.34	13 1 1.8	5.7	3.3	0.22
16	18 41.2	14 28 38.16	−13 11 27.0	5.7	3.3	0.22
17	18 39.4	14 30 43.76	13 21 46.4	5.8	3.3	0.23
18	18 37.5	14 32 49.12	13 31 59.9	5.8	3.3	0.23
19	18 35.7	14 34 54.23	13 42 7.4	5.8	3.4	0.23
20	18 33.8	14 36 59.09	13 52 8.9	5.9	3.4	0.23
21	18 32.0	14 39 3.68	−14 2 4.3	5.9	3.4	0.23
22	18 30.1	14 41 7.99	14 11 53.5	5.9	3.4	0.23
23	18 28.2	14 43 12.02	14 21 36.6	6.0	3.4	0.24
24	18 26.4	14 45 15.76	14 31 13.6	6.0	3.5	0.24
25	18 24.5	14 47 19.19	14 40 44.3	6.1	3.5	0.24
26	18 22.6	14 49 22.31	−14 50 8.8	6.2	3.5	0.24
27	18 20.7	14 51 25.10	14 59 27.1	6.2	3.5	0.24
28	18 18.8	14 53 27.57	15 8 39.1	6.3	3.5	0.24
29	18 16.9	14 55 29.69	15 17 44.8	6.3	3.6	0.25
30	18 15.0	14 57 31.47	15 26 44.2	6.3	3.6	0.25
31	18 13.1	14 59 32.89	−15 35 37.3	6.4	3.6	0.25
Feb. 1	18 11.2	15 1 33.94	15 44 24.1	6.4	3.6	0.25
2	18 9.2	15 3 34.61	15 53 4.7	6.5	3.7	0.26
3	18 7.3	15 5 34.88	16 1 38.9	6.5	3.7	0.26
4	18 5.4	15 7 34.75	16 10 6.8	6.6	3.7	0.26
5	18 3.4	15 9 34.21	−16 18 28.5	6.6	3.8	0.26
6	18 1.5	15 11 33.22	16 26 43.6	6.7	3.8	0.26
7	17 59.5	15 13 31.78	16 34 52.4	6.7	3.8	0.26
8	17 57.5	15 15 29.87	16 42 54.9	6.8	3.9	0.27
9	17 55.6	15 17 27.46	16 50 51.0	6.8	3.9	0.27
10	17 53.6	15 19 24.55	−16 58 40.6	6.9	3.9	0.27
11	17 51.6	15 21 21.12	17 6 23.8	6.9	4.0	0.27
12	17 49.6	15 23 17.13	17 14 0.6	7.0	4.0	0.28
13	17 47.6	15 25 12.57	17 21 31.0	7.0	4.0	0.28
14	17 45.5	15 27 7.41	17 28 54.9	7.1	4.1	0.28
15	17 43.5	15 29 1.63	−17 36 12.3	7.2	4.1	0.28
16	17 41.5	15 30 55.21	−17 43 23.2	7.2	4.1	0.29
Feb. 15	17 43.5	15 29 1.63	−17 36 12.3	7.2	4.1	0.28
16	17 41.5	15 30 55.21	17 43 23.2	7.2	4.1	0.29
17	17 39.4	15 32 48.14	17 50 27.7	7.3	4.2	0.29
18	17 37.3	15 34 40.37	17 57 25.7	7.3	4.2	0.29
19	17 35.3	15 36 31.90	18 4 17.3	7.4	4.3	0.30
20	17 33.2	15 38 22.70	−18 11 2.5	7.5	4.3	0.30
21	17 31.1	15 40 12.75	18 17 41.2	7.5	4.3	0.30
22	17 29.0	15 42 2.03	18 24 13.6	7.6	4.4	0.31
23	17 26.8	15 43 50.51	18 30 39.8	7.7	4.4	0.31
24	17 24.7	15 45 38.18	18 36 59.6	7.7	4.5	0.31
25	17 22.5	15 47 25.01	−18 43 13.3	7.8	4.5	0.32
26	17 20.3	15 49 10.99	18 49 20.8	7.9	4.5	0.32
27	17 18.2	15 50 56.09	18 55 22.2	7.9	4.6	0.32
28	17 16.0	15 52 40.29	19 1 17.6	8.0	4.6	0.32
Mar. 1	17 13.8	15 54 23.56	19 7 7.0	8.1	4.7	0.33
2	17 11.5	15 56 5.88	−19 12 50.5	8.2	4.7	0.33
3	17 9.3	15 57 47.23	19 18 28.2	8.2	4.7	0.33
4	17 7.0	15 59 27.58	19 24 0.1	8.3	4.8	0.34
5	17 4.7	16 1 6.89	19 29 26.3	8.4	4.8	0.34
6	17 2.4	16 2 45.14	19 34 46.8	8.5	4.9	0.34
7	17 0.1	16 4 22.31	−19 40 1.7	8.6	4.9	0.34
8	16 57.8	16 5 58.35	19 45 11.1	8.6	4.9	0.35
9	16 55.4	16 7 33.22	19 50 15.0	8.7	5.0	0.35
10	16 53.0	16 9 6.89	19 55 13.5	8.8	5.0	0.35
11	16 50.6	16 10 39.32	20 0 6.6	8.9	5.1	0.36
12	16 48.2	16 12 10.48	−20 4 54.4	9.0	5.1	0.36
13	16 45.8	16 13 40.31	20 9 36.9	9.0	5.2	0.36
14	16 43.3	16 15 8.78	20 14 14.2	9.1	5.2	0.37
15	16 40.8	16 16 35.85	20 18 46.4	9.2	5.3	0.37
16	16 38.3	16 18 1.47	20 23 13.6	9.3	5.3	0.37
17	16 35.8	16 19 25.61	−20 27 35.7	9.4	5.4	0.38
18	16 33.3	16 20 48.23	20 31 52.9	9.5	5.4	0.38
19	16 30.7	16 22 9.28	20 36 5.3	9.6	5.5	0.39
20	16 28.1	16 23 28.71	20 40 13.0	9.7	5.5	0.39
21	16 25.4	16 24 46.49	20 44 16.1	9.8	5.6	0.40
22	16 22.7	16 26 2.57	−20 48 14.7	9.9	5.7	0.40
23	16 20.0	16 27 16.94	20 52 8.8	10.0	5.7	0.41
24	16 17.3	16 28 29.54	20 55 58.7	10.1	5.8	0.41
25	16 14.6	16 29 40.31	20 59 44.3	10.2	5.8	0.41
26	16 11.8	16 30 49.23	21 3 25.8	10.3	5.9	0.42
27	16 9.0	16 31 56.27	−21 7 3.4	10.4	6.0	0.42
28	16 6.1	16 33 1.38	21 10 37.2	10.6	6.0	0.43
29	16 3.2	16 34 4.53	21 14 7.3	10.7	6.1	0.43
30	16 0.3	16 35 5.66	21 17 33.7	10.8	6.1	0.44
31	15 57.4	16 36 4.72	21 20 56.7	10.9	6.2	0.44
Apr. 1	15 54.4	16 37 1.67	−21 24 16.3	11.0	6.3	0.45
2	15 51.4	16 37 56.46	−21 27 32.5	11.1	6.3	0.45

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	15 54.4	16 37 1.67	−21 24 16.3	11.0	6.3	0.45	May 17	12 46.8	16 30 18.31	−23 3 49.3	17.2	9.8	0.71
2	15 51.4	16 37 56.46	21 27 32.5	11.1	6.3	0.45	18	12 41.6	16 29 0.44	23 4 23.8	17.3	9.9	0.71
3	15 48.3	16 38 49.04	21 30 45.5	11.2	6.4	0.46	19	12 36.4	16 27 40.56	23 4 52.1	17.4	9.9	0.72
4	15 45.2	16 39 39.37	21 33 55.5	11.4	6.4	0.46	20	12 31.1	16 26 18.82	23 5 14.1	17.5	10.0	0.72
5	15 42.1	16 40 27.38	21 37 2.4	11.5	6.5	0.47	21	12 25.8	16 24 55.39	23 5 29.8	17.6	10.0	0.73
6	15 38.9	16 41 13.04	−21 40 6.3	11.6	6.6	0.47	22	12 20.4	16 23 30.47	−23 5 39.2	17.6	10.0	0.73
7	15 35.7	16 41 56.28	21 43 7.3	11.7	6.6	0.48	23	12 15.1	16 22 4.23	23 5 42.4	17.7	10.1	0.73
8	15 32.4	16 42 37.03	21 46 5.5	11.9	6.7	0.48	24	12 9.7	16 20 36.85	23 5 39.5	17.7	10.1	0.74
9	15 29.1	16 43 15.24	21 49 0.9	12.0	6.8	0.49	25	12 4.3	16 19 8.53	23 5 30.5	17.8	10.2	0.74
10	15 25.8	16 43 50.87	21 51 53.6	12.1	6.9	0.49	26	11 58.8	16 17 39.46	23 5 15.8	17.9	10.2	0.74
11	15 22.4	16 44 23.84	−21 54 43.6	12.2	7.0	0.50	27	11 53.4	16 16 9.83	−23 4 55.3	17.9	10.2	0.74
12	15 19.0	16 44 54.08	21 57 30.8	12.4	7.0	0.50	28	11 48.0	16 14 39.85	23 4 29.4	18.0	10.3	0.74
13	15 15.5	16 45 21.57	22 0 15.5	12.5	7.1	0.51	29	11 42.6	16 13 9.69	23 3 58.2	18.1	10.3	0.75
14	15 12.0	16 45 46.24	22 2 57.6	12.7	7.2	0.51	30	11 37.1	16 11 39.56	23 3 21.9	18.1	10.3	0.75
15	15 8.4	16 46 8.05	22 5 37.1	12.8	7.3	0.52	31	11 31.7	16 10 9.63	23 2 40.9	18.2	10.4	0.75
16	15 4.8	16 46 26.94	−22 8 14.1	12.9	7.4	0.53	June 1	11 26.2	16 8 40.11	−23 1 55.4	18.2	10.4	0.75
17	15 1.1	16 46 42.86	22 10 48.6	13.1	7.4	0.53	2	11 20.8	16 7 11.17	23 1 5.8	18.2	10.4	0.75
18	14 57.4	16 46 55.75	22 13 20.4	13.2	7.5	0.54	3	11 15.4	16 5 43.03	23 0 12.5	18.2	10.4	0.75
19	14 53.6	16 47 5.59	22 15 49.8	13.4	7.6	0.54	4	11 10.1	16 4 15.85	22 59 15.7	18.2	10.4	0.75
20	14 49.8	16 47 12.36	22 18 16.7	13.5	7.7	0.55	5	11 4.7	16 2 49.82	22 58 15.9	18.2	10.4	0.75
21	14 45.9	16 47 16.02	−22 20 41.1	13.6	7.8	0.56	6	10 59.4	16 1 25.10	−22 57 13.5	18.2	10.4	0.75
22	14 42.0	16 47 16.54	22 23 2.9	13.8	7.8	0.56	7	10 54.1	16 0 1.87	22 56 9.0	18.2	10.4	0.75
23	14 38.0	16 47 13.89	22 25 22.2	13.9	7.9	0.57	8	10 48.8	15 58 40.30	22 55 3.0	18.2	10.4	0.75
24	14 34.0	16 47 8.04	22 27 39.0	14.1	8.0	0.57	9	10 43.5	15 57 20.56	22 53 55.6	18.2	10.4	0.75
25	14 29.9	16 46 58.98	22 29 53.2	14.2	8.1	0.58	10	10 38.3	15 56 2.83	22 52 47.5	18.2	10.4	0.75
26	14 25.8	16 46 46.70	−22 32 4.7	14.3	8.2	0.59	11	10 33.1	15 54 47.27	−22 51 39.3	18.2	10.3	0.75
27	14 21.6	16 46 31.20	22 34 13.5	14.5	8.2	0.59	12	10 28.0	15 53 34.03	22 50 31.6	18.1	10.3	0.74
28	14 17.4	16 46 12.44	22 36 19.6	14.7	8.3	0.60	13	10 22.9	15 52 23.24	22 49 24.8	18.1	10.3	0.74
29	14 13.1	16 45 50.42	22 38 22.7	14.8	8.4	0.60	14	10 17.8	15 51 15.05	22 48 19.6	18.1	10.2	0.74
30	14 8.7	16 45 25.13	22 40 22.8	15.0	8.5	0.61	15	10 12.8	15 50 9.61	22 47 16.6	17.9	10.2	0.74
May 1	14 4.3	16 44 56.59	−22 42 19.6	15.1	8.6	0.62	16	10 7.8	15 49 7.04	−22 46 16.3	17.8	10.2	0.74
2	13 59.9	16 44 24.79	22 44 13.2	15.2	8.6	0.62	17	10 2.9	15 48 7.44	22 45 19.0	17.8	10.1	0.74
3	13 55.3	16 43 49.75	22 46 3.3	15.4	8.7	0.63	18	9 58.0	15 47 10.92	22 44 25.5	17.7	10.1	0.73
4	13 50.8	16 43 11.46	22 47 49.8	15.5	8.8	0.64	19	9 53.2	15 46 17.59	22 43 36.4	17.6	10.0	0.73
5	13 46.2	16 42 29.96	22 49 32.5	15.7	8.9	0.64	20	9 48.4	15 45 27.53	22 42 52.0	17.6	10.0	0.73
6	13 41.5	16 41 45.27	−22 51 11.1	15.8	9.0	0.65	21	9 43.7	15 44 40.80	−22 42 12.9	17.5	10.0	0.72
7	13 36.8	16 40 57.43	22 52 45.4	16.0	9.0	0.65	22	9 39.1	15 43 57.48	22 41 39.2	17.4	9.9	0.72
8	13 32.0	16 40 6.45	22 54 15.4	16.1	9.1	0.66	23	9 34.5	15 43 17.61	22 41 11.5	17.3	9.9	0.71
9	13 27.2	16 39 12.40	22 55 40.6	16.3	9.2	0.67	24	9 29.9	15 42 41.24	22 40 50.1	17.2	9.8	0.71
10	13 22.3	16 38 15.33	22 57 1.0	16.4	9.3	0.67	25	9 25.4	15 42 8.40	22 40 35.4	17.1	9.8	0.70
11	13 17.4	16 37 15.32	−22 58 16.2	16.5	9.4	0.68	26	9 21.0	15 41 39.12	−22 40 27.5	17.0	9.7	0.70
12	13 12.4	16 36 12.41	22 59 26.0	16.6	9.4	0.68	27	9 16.7	15 41 13.40	22 40 26.9	16.9	9.6	0.70
13	13 7.4	16 35 6.72	23 0 30.4	16.7	9.5	0.69	28	9 12.4	15 40 51.25	22 40 33.5	16.8	9.6	0.70
14	13 2.3	16 33 58.35	23 1 29.0	16.8	9.6	0.69	29	9 8.1	15 40 32.69	22 40 47.6	16.7	9.5	0.69
15	12 57.2	16 32 47.41	23 2 21.8	16.9	9.7	0.70	30	9 3.9	15 40 17.72	22 41 9.3	16.6	9.5	0.69
16	12 52.0	16 31 34.02	−23 3 8.6	17.1	9.7	0.70	July 1	8 59.8	15 40 6.30	−22 41 38.7	16.5	9.5	0.68
17	12 46.8	16 30 18.31	−23 3 49.3	17.2	9.8	0.71	2	8 55.8	15 39 58.43	−22 42 15.8	16.4	9.4	0.68

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
July 1	8 59.8	15 40 6.30	-22 41 38.7	16.5	9.5	0.68	Aug. 15	6 47.9	16 25 16.19	-24 49 51.8	11.9	6.8	0.49
2	8 55.8	15 39 58.43	22 42 15.8	16.4	9.4	0.68	16	6 45.9	16 27 13.94	24 53 38.8	11.8	6.7	0.49
3	8 51.8	15 39 54.11	22 43 0.8	16.3	9.3	0.67	17	6 44.0	16 29 13.61	24 57 23.6	11.7	6.7	0.49
4	8 47.8	15 39 53.31	22 43 53.6	16.2	9.2	0.67	18	6 42.1	16 31 15.17	25 1 5.8	11.6	6.6	0.48
5	8 43.9	15 39 56.03	22 44 54.2	16.1	9.2	0.66	19	6 40.2	16 33 18.59	25 4 45.2	11.5	6.6	0.48
6	8 40.1	15 40 2.22	-22 46 2.7	16.0	9.1	0.66	20	6 38.4	16 35 23.83	-25 8 21.6	11.4	6.5	0.48
7	8 36.3	15 40 11.88	22 47 19.0	15.9	9.0	0.65	21	6 36.6	16 37 30.87	25 11 54.5	11.4	6.4	0.48
8	8 32.6	15 40 24.99	22 48 43.2	15.8	9.0	0.65	22	6 34.8	16 39 39.64	25 15 23.6	11.3	6.4	0.47
9	8 29.0	15 40 41.52	22 50 15.1	15.7	8.9	0.64	23	6 33.0	16 41 50.10	25 18 48.5	11.2	6.3	0.47
10	8 25.4	15 41 1.44	22 51 54.7	15.5	8.9	0.64	24	6 31.3	16 44 2.23	25 22 9.0	11.1	6.3	0.47
11	8 21.8	15 41 24.72	-22 53 42.0	15.4	8.8	0.63	25	6 29.6	16 46 16.01	-25 25 24.9	11.0	6.3	0.46
12	8 18.3	15 41 51.35	22 55 36.9	15.3	8.7	0.63	26	6 27.9	16 48 31.38	25 28 35.7	11.0	6.2	0.46
13	8 14.9	15 42 21.31	22 57 39.4	15.2	8.7	0.63	27	6 26.2	16 50 48.32	25 31 41.1	10.9	6.2	0.46
14	8 11.5	15 42 54.58	22 59 49.3	15.1	8.6	0.62	28	6 24.6	16 53 6.78	25 34 40.9	10.8	6.1	0.45
15	8 8.2	15 43 31.11	23 2 6.4	15.0	8.6	0.62	29	6 23.0	16 55 26.74	25 37 34.9	10.7	6.1	0.45
16	8 4.9	15 44 10.84	-23 4 30.7	14.9	8.5	0.61	30	6 21.4	16 57 48.17	-25 40 22.5	10.7	6.1	0.45
17	8 1.7	15 44 53.75	23 7 1.8	14.8	8.4	0.61	31	6 19.8	17 0 11.03	25 43 3.6	10.6	6.0	0.45
18	7 58.5	15 45 39.78	23 9 39.6	14.6	8.3	0.61	Sept. 1	6 18.3	17 2 35.30	25 45 37.9	10.5	6.0	0.44
19	7 55.4	15 46 28.91	23 12 24.0	14.5	8.2	0.60	2	6 16.8	17 5 0.94	25 48 5.2	10.4	5.9	0.44
20	7 52.3	15 47 21.10	23 15 14.7	14.4	8.2	0.60	3	6 15.3	17 7 27.94	25 50 25.3	10.4	5.9	0.44
21	7 49.3	15 48 16.30	-23 18 11.5	14.3	8.1	0.59	4	6 13.8	17 9 56.28	-25 52 37.8	10.3	5.9	0.44
22	7 46.3	15 49 14.47	23 21 14.1	14.2	8.0	0.59	5	6 12.4	17 12 25.93	25 54 42.7	10.2	5.8	0.43
23	7 43.4	15 50 15.54	23 24 22.2	14.1	8.0	0.58	6	6 11.0	17 14 56.86	25 56 39.6	10.2	5.8	0.43
24	7 40.6	15 51 19.48	23 27 35.6	14.0	7.9	0.58	7	6 9.6	17 17 29.06	25 58 28.2	10.1	5.7	0.43
25	7 37.8	15 52 26.22	23 30 53.8	13.9	7.9	0.57	8	6 8.2	17 20 2.49	26 0 8.2	10.0	5.7	0.42
26	7 35.0	15 53 35.72	-23 34 16.7	13.8	7.8	0.57	9	6 6.8	17 22 37.14	-26 1 39.5	10.0	5.7	0.42
27	7 32.2	15 54 47.94	23 37 43.9	13.7	7.7	0.56	10	6 5.5	17 25 12.98	26 3 2.0	9.9	5.6	0.42
28	7 29.5	15 56 2.81	23 41 15.1	13.6	7.7	0.56	11	6 4.2	17 27 49.99	26 4 15.4	9.8	5.6	0.42
29	7 26.9	15 57 20.29	23 44 50.0	13.5	7.6	0.55	12	6 2.9	17 30 28.16	26 5 19.4	9.8	5.6	0.41
30	7 24.3	15 58 40.33	23 48 28.2	13.4	7.6	0.55	13	6 1.6	17 33 7.45	26 6 13.9	9.7	5.5	0.41
31	7 21.7	16 0 2.87	-23 52 9.4	13.3	7.5	0.55	14	6 0.3	17 35 47.83	-26 6 58.6	9.7	5.5	0.41
Aug. 1	7 19.2	16 1 27.87	23 55 53.1	13.2	7.5	0.54	15	5 59.1	17 38 29.29	26 7 33.3	9.6	5.5	0.41
2	7 16.7	16 2 55.30	23 59 39.3	13.1	7.4	0.54	16	5 57.8	17 41 11.78	26 7 57.8	9.5	5.4	0.41
3	7 14.3	16 4 25.11	24 3 27.4	13.0	7.4	0.54	17	5 56.6	17 43 55.28	26 8 11.9	9.5	5.4	0.40
4	7 11.9	16 5 57.26	24 7 17.2	12.9	7.3	0.53	18	5 55.4	17 46 39.76	26 8 15.4	9.4	5.4	0.40
5	7 9.5	16 7 31.73	-24 11 8.4	12.8	7.3	0.53	19	5 54.3	17 49 25.18	-26 8 8.1	9.3	5.4	0.40
6	7 7.2	16 9 8.47	24 15 0.7	12.7	7.2	0.53	20	5 53.1	17 52 11.53	26 7 49.9	9.3	5.3	0.40
7	7 4.9	16 10 47.45	24 18 53.7	12.6	7.2	0.52	21	5 51.9	17 54 58.75	26 7 20.5	9.2	5.3	0.39
8	7 2.7	16 12 28.63	24 22 47.3	12.5	7.1	0.52	22	5 50.8	17 57 46.82	26 6 39.7	9.2	5.3	0.39
9	7 0.5	16 14 11.99	24 26 41.1	12.4	7.1	0.52	23	5 49.7	18 0 35.72	26 5 47.4	9.1	5.2	0.39
10	6 58.3	16 15 57.49	-24 30 34.8	12.3	7.0	0.51	24	5 48.5	18 3 25.41	-26 4 43.4	9.1	5.2	0.39
11	6 56.2	16 17 45.12	24 34 28.2	12.2	6.9	0.51	25	5 47.4	18 6 15.85	26 3 27.6	9.0	5.2	0.38
12	6 54.1	16 19 34.83	24 38 20.9	12.1	6.9	0.51	26	5 46.4	18 9 7.03	26 1 59.8	9.0	5.1	0.38
13	6 52.0	16 21 26.59	24 42 12.5	12.0	6.8	0.50	27	5 45.3	18 11 58.90	26 0 19.9	8.9	5.1	0.38
14	6 49.9	16 23 20.39	24 46 2.9	11.9	6.8	0.50	28	5 44.2	18 14 51.44	25 58 27.7	8.9	5.1	0.38
15	6 47.9	16 25 16.19	-24 49 51.8	11.9	6.8	0.50	29	5 43.2	18 17 44.64	-25 56 23.2	8.8	5.0	0.37
16	6 45.9	16 27 13.94	-24 53 38.8	11.8	6.7	0.49	30	5 42.1	18 20 38.46	-25 54 6.2	8.8	5.0	0.37

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
May 1	18 12.7	20 54 0.56	−17 57 6.2	1.8	18.8	1.40	June 16	15 15.2	20 57 20.89	−17 53 50.9	2.0	21.6	1.61
2	18 9.1	20 54 21.31	17 55 54.2	1.8	18.8	1.41	17	15 11.0	20 57 7.65	17 54 59.5	2.0	21.7	1.62
3	18 5.5	20 54 41.39	17 54 44.9	1.8	18.9	1.41	18	15 6.9	20 56 53.68	17 56 11.0	2.0	21.7	1.62
4	18 1.9	20 55 0.79	17 53 38.3	1.8	18.9	1.42	19	15 2.7	20 56 39.01	17 57 25.3	2.1	21.8	1.63
5	17 58.3	20 55 19.51	17 52 34.4	1.8	19.0	1.42	20	14 58.5	20 56 23.64	17 58 42.4	2.1	21.9	1.63
6	17 54.7	20 55 37.54	−17 51 33.3	1.8	19.0	1.42	21	14 54.3	20 56 7.56	−18 0 2.1	2.1	21.9	1.64
7	17 51.0	20 55 54.89	17 50 34.9	1.8	19.1	1.43	22	14 50.1	20 55 50.84	18 1 24.5	2.1	22.0	1.64
8	17 47.3	20 56 11.53	17 49 39.4	1.8	19.1	1.43	23	14 45.9	20 55 33.43	18 2 49.4	2.1	22.0	1.65
9	17 43.7	20 56 27.47	17 48 46.9	1.8	19.2	1.44	24	14 41.6	20 55 15.36	18 4 16.9	2.1	22.1	1.65
10	17 40.0	20 56 42.70	17 47 57.2	1.8	19.3	1.44	25	14 37.4	20 54 56.64	18 5 46.8	2.1	22.1	1.65
11	17 36.3	20 56 57.22	−17 47 10.4	1.8	19.4	1.45	26	14 33.1	20 54 37.28	−18 7 19.2	2.1	22.2	1.66
12	17 32.6	20 57 11.01	17 46 26.6	1.8	19.4	1.45	27	14 28.9	20 54 17.29	18 8 53.9	2.1	22.2	1.66
13	17 28.9	20 57 24.09	17 45 45.8	1.8	19.5	1.46	28	14 24.6	20 53 56.69	18 10 30.8	2.1	22.3	1.66
14	17 25.2	20 57 36.43	17 45 8.0	1.8	19.5	1.46	29	14 20.3	20 53 35.49	18 12 10.0	2.1	22.3	1.67
15	17 21.4	20 57 48.03	17 44 33.2	1.8	19.6	1.47	30	14 16.0	20 53 13.69	18 13 51.3	2.1	22.4	1.67
16	17 17.7	20 57 58.90	−17 44 1.5	1.8	19.6	1.47	July 1	14 11.7	20 52 51.31	−18 15 34.6	2.1	22.4	1.68
17	17 13.9	20 58 9.02	17 43 32.9	1.9	19.7	1.48	2	14 7.4	20 52 28.36	18 17 19.9	2.1	22.5	1.68
18	17 10.1	20 58 18.40	17 43 7.5	1.9	19.8	1.48	3	14 3.1	20 52 4.86	18 19 7.1	2.1	22.5	1.69
19	17 6.3	20 58 27.03	17 42 45.1	1.9	19.9	1.48	4	13 58.8	20 51 40.82	18 20 56.2	2.1	22.6	1.69
20	17 2.6	20 58 34.91	17 42 25.9	1.9	19.9	1.49	5	13 54.4	20 51 16.25	18 22 47.1	2.1	22.6	1.69
21	16 58.8	20 58 42.04	−17 42 9.9	1.9	20.0	1.49	6	13 50.1	20 50 51.17	−18 24 39.7	2.1	22.6	1.69
22	16 54.9	20 58 48.41	17 41 57.1	1.9	20.0	1.50	7	13 45.7	20 50 25.59	18 26 33.9	2.1	22.7	1.70
23	16 51.1	20 58 54.02	17 41 47.4	1.9	20.1	1.50	8	13 41.4	20 49 59.53	18 28 29.6	2.1	22.7	1.70
24	16 47.2	20 58 58.87	17 41 41.0	1.9	20.2	1.51	9	13 37.0	20 49 33.00	18 30 26.8	2.1	22.8	1.70
25	16 43.4	20 59 2.97	17 41 37.7	1.9	20.2	1.51	10	13 32.6	20 49 6.01	18 32 25.4	2.1	22.8	1.70
26	16 39.5	20 59 6.30	−17 41 37.7	1.9	20.3	1.52	11	13 28.2	20 48 38.59	−18 34 25.2	2.1	22.8	1.71
27	16 35.6	20 59 8.87	17 41 40.9	1.9	20.4	1.52	12	13 23.8	20 48 10.76	18 36 26.3	2.1	22.9	1.71
28	16 31.7	20 59 10.68	17 41 47.3	1.9	20.5	1.53	13	13 19.4	20 47 42.52	18 38 28.4	2.1	22.9	1.71
29	16 27.8	20 59 11.73	17 41 56.9	1.9	20.5	1.53	14	13 15.0	20 47 13.91	18 40 31.6	2.2	22.9	1.71
30	16 23.9	20 59 12.02	17 42 9.7	1.9	20.6	1.54	15	13 10.6	20 46 44.94	18 42 35.6	2.2	22.9	1.72
31	16 19.9	20 59 11.55	−17 42 25.8	1.9	20.6	1.54	16	13 6.2	20 46 15.64	−18 44 40.5	2.2	22.9	1.72
June 1	16 16.0	20 59 10.32	17 42 45.0	1.9	20.7	1.54	17	13 1.7	20 45 46.02	18 46 46.2	2.2	23.0	1.72
2	16 12.0	20 59 8.32	17 43 7.4	2.0	20.7	1.55	18	12 57.3	20 45 16.11	18 48 52.5	2.2	23.0	1.72
3	16 8.0	20 59 5.57	17 43 33.1	2.0	20.8	1.55	19	12 52.9	20 44 45.93	18 50 59.3	2.2	23.0	1.73
4	16 4.0	20 59 2.05	17 44 1.9	2.0	20.9	1.56	20	12 48.5	20 44 15.50	18 53 6.5	2.2	23.0	1.73
5	16 0.0	20 58 57.77	−17 44 33.8	2.0	21.0	1.56	21	12 44.0	20 43 44.85	−18 55 14.1	2.2	23.0	1.73
6	15 56.0	20 58 52.73	17 45 9.0	2.0	21.0	1.57	22	12 39.6	20 43 13.99	18 57 21.9	2.2	23.0	1.73
7	15 52.0	20 58 46.93	17 45 47.3	2.0	21.1	1.57	23	12 35.1	20 42 42.95	18 59 29.9	2.2	23.1	1.73
8	15 48.0	20 58 40.37	17 46 28.8	2.0	21.1	1.58	24	12 30.7	20 42 11.75	19 1 38.0	2.2	23.1	1.73
9	15 43.9	20 58 33.06	17 47 13.3	2.0	21.2	1.58	25	12 26.2	20 41 40.41	19 3 46.0	2.2	23.1	1.73
10	15 39.8	20 58 24.99	−17 48 1.0	2.0	21.2	1.59	26	12 21.8	20 41 8.96	−19 5 53.8	2.2	23.1	1.74
11	15 35.8	20 58 16.17	17 48 51.8	2.0	21.3	1.59	27	12 17.3	20 40 37.41	19 8 1.5	2.2	23.1	1.74
12	15 31.7	20 58 6.59	17 49 45.6	2.0	21.4	1.59	28	12 12.9	20 40 5.80	19 10 8.8	2.2	23.1	1.74
13	15 27.6	20 57 56.27	17 50 42.4	2.0	21.4	1.60	29	12 8.4	20 39 34.14	19 12 15.7	2.2	23.1	1.74
14	15 23.5	20 57 45.22	17 51 42.3	2.0	21.5	1.60	30	12 3.9	20 39 2.45	19 14 22.1	2.2	23.1	1.74
15	15 19.3	20 57 33.42	−17 52 45.1	2.0	21.5	1.61	31	11 59.4	20 38 30.76	−19 16 28.0	2.2	23.1	1.74
16	15 15.2	20 57 20.89	−17 53 50.9	2.0	21.6	1.61	Aug. 1	11 55.0	20 37 59.09	−19 18 33.1	2.2	23.1	1.74

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Aug. 1	11 55.0	20 37 59.09	−19 18 33.1	2.2	23.1	1.74	Sept. 16	8 36.3	20 20 3.27	−20 23 27.8	2.0	21.5	1.63
2	11 50.5	20 37 27.46	19 20 37.5	2.2	23.1	1.74	17	8 32.2	20 19 54.41	20 23 55.8	2.0	21.4	1.62
3	11 46.1	20 36 55.89	19 22 41.1	2.2	23.1	1.74	18	8 28.1	20 19 46.34	20 24 21.1	2.0	21.4	1.62
4	11 41.6	20 36 24.41	19 24 43.8	2.2	23.1	1.74	19	8 24.1	20 19 39.08	20 24 43.6	2.0	21.3	1.61
5	11 37.1	20 35 53.04	19 26 45.4	2.2	23.1	1.74	20	8 20.0	20 19 32.63	20 25 3.3	2.0	21.3	1.61
6	11 32.7	20 35 21.79	−19 28 46.0	2.2	23.1	1.74	21	8 16.0	20 19 26.98	−20 25 20.3	2.0	21.2	1.61
7	11 28.3	20 34 50.69	19 30 45.5	2.2	23.1	1.74	22	8 12.0	20 19 22.13	20 25 34.5	2.0	21.1	1.60
8	11 23.8	20 34 19.77	19 32 43.8	2.2	23.1	1.74	23	8 8.0	20 19 18.10	20 25 45.9	2.0	21.1	1.60
9	11 19.3	20 33 49.05	19 34 40.7	2.2	23.1	1.74	24	8 4.0	20 19 14.88	20 25 54.5	2.0	21.0	1.59
10	11 14.9	20 33 18.54	19 36 36.3	2.2	23.0	1.74	25	8 0.0	20 19 12.46	20 26 0.4	2.0	20.9	1.59
11	11 10.5	20 32 48.28	−19 38 30.5	2.2	23.0	1.73	26	7 56.1	20 19 10.86	−20 26 3.5	2.0	20.9	1.58
12	11 6.0	20 32 18.28	19 40 23.2	2.2	23.0	1.73	27	7 52.1	20 19 10.08	20 26 3.9	2.0	20.8	1.58
13	11 1.6	20 31 48.57	19 42 14.3	2.2	23.0	1.73	28	7 48.2	20 19 10.11	20 26 1.6	2.0	20.8	1.57
14	10 57.2	20 31 19.17	19 44 3.6	2.2	22.9	1.73	29	7 44.3	20 19 10.95	20 25 56.5	1.9	20.7	1.57
15	10 52.8	20 30 50.11	19 45 51.3	2.2	22.9	1.73	30	7 40.4	20 19 12.60	20 25 48.7	1.9	20.6	1.56
16	10 48.4	20 30 21.41	−19 47 37.1	2.2	22.9	1.73	Oct. 1	7 36.5	20 19 15.06	−20 25 38.1	1.9	20.6	1.56
17	10 44.0	20 29 53.09	19 49 21.2	2.2	22.9	1.73	2	7 32.6	20 19 18.33	20 25 24.9	1.9	20.5	1.55
18	10 39.6	20 29 25.17	19 51 3.2	2.1	22.8	1.72	3	7 28.7	20 19 22.41	20 25 8.9	1.9	20.4	1.55
19	10 35.2	20 28 57.67	19 52 43.3	2.1	22.8	1.72	4	7 24.9	20 19 27.31	20 24 50.1	1.9	20.4	1.54
20	10 30.8	20 28 30.61	19 54 21.4	2.1	22.8	1.72	5	7 21.0	20 19 33.01	20 24 28.7	1.9	20.3	1.54
21	10 26.4	20 28 4.00	−19 55 57.5	2.1	22.7	1.72	6	7 17.2	20 19 39.51	−20 24 4.6	1.9	20.2	1.53
22	10 22.1	20 27 37.88	19 57 31.3	2.1	22.7	1.72	7	7 13.4	20 19 46.82	20 23 37.7	1.9	20.2	1.53
23	10 17.7	20 27 12.26	19 59 3.0	2.1	22.7	1.71	8	7 9.6	20 19 54.93	20 23 8.1	1.9	20.1	1.52
24	10 13.4	20 26 47.14	20 0 32.5	2.1	22.6	1.71	9	7 5.8	20 20 3.84	20 22 35.9	1.9	20.1	1.52
25	10 9.1	20 26 22.55	20 1 59.8	2.1	22.6	1.71	10	7 2.1	20 20 13.55	20 22 1.0	1.9	20.0	1.51
26	10 4.7	20 25 58.51	−20 3 24.7	2.1	22.6	1.71	11	6 58.3	20 20 24.07	−20 21 23.3	1.9	20.0	1.51
27	10 0.4	20 25 35.04	20 4 47.2	2.1	22.5	1.70	12	6 54.6	20 20 35.37	20 20 43.0	1.9	19.9	1.50
28	9 56.1	20 25 12.13	20 6 7.4	2.1	22.5	1.70	13	6 50.8	20 20 47.46	20 19 59.9	1.9	19.8	1.50
29	9 51.8	20 24 49.82	20 7 25.3	2.1	22.4	1.70	14	6 47.1	20 21 0.34	20 19 14.2	1.9	19.7	1.49
30	9 47.5	20 24 28.12	20 8 40.6	2.1	22.4	1.69	15	6 43.4	20 21 14.00	20 18 25.8	1.9	19.7	1.49
31	9 43.2	20 24 7.03	−20 9 53.5	2.1	22.3	1.69	16	6 39.7	20 21 28.44	−20 17 34.8	1.8	19.6	1.48
Sept. 1	9 39.0	20 23 46.56	20 11 4.0	2.1	22.3	1.69	17	6 36.0	20 21 43.64	20 16 41.2	1.8	19.6	1.48
2	9 34.7	20 23 26.73	20 12 11.9	2.1	22.2	1.68	18	6 32.4	20 21 59.61	20 15 44.8	1.8	19.5	1.48
3	9 30.4	20 23 7.57	20 13 17.3	2.1	22.2	1.68	19	6 28.7	20 22 16.33	20 14 45.8	1.8	19.4	1.47
4	9 26.2	20 22 49.08	20 14 20.1	2.1	22.1	1.68	20	6 25.1	20 22 33.80	20 13 44.2	1.8	19.4	1.47
5	9 22.0	20 22 31.26	−20 15 20.4	2.1	22.1	1.67	21	6 21.5	20 22 52.02	−20 12 39.9	1.8	19.3	1.46
6	9 17.8	20 22 14.13	20 16 18.0	2.1	22.0	1.67	22	6 17.9	20 23 10.97	20 11 33.0	1.8	19.3	1.46
7	9 13.6	20 21 57.71	20 17 13.1	2.1	22.0	1.66	23	6 14.3	20 23 30.65	20 10 23.5	1.8	19.2	1.45
8	9 9.4	20 21 42.00	20 18 5.6	2.1	21.9	1.66	24	6 10.7	20 23 51.06	20 9 11.4	1.8	19.1	1.45
9	9 5.2	20 21 27.01	20 18 55.3	2.1	21.9	1.65	25	6 7.1	20 24 12.18	20 7 56.7	1.8	19.1	1.44
10	9 1.0	20 21 12.76	−20 19 42.4	2.1	21.8	1.65	26	6 3.5	20 24 34.02	−20 6 39.4	1.8	19.0	1.44
11	8 56.8	20 20 59.27	20 20 26.8	2.1	21.8	1.64	27	5 59.9	20 24 56.56	20 5 19.6	1.8	19.0	1.43
12	8 52.7	20 20 46.53	20 21 8.5	2.0	21.7	1.64	28	5 56.4	20 25 19.80	20 3 57.3	1.8	18.9	1.43
13	8 48.6	20 20 34.55	20 21 47.5	2.0	21.7	1.64	29	5 52.9	20 25 43.73	20 2 32.4	1.8	18.8	1.42
14	8 44.5	20 20 23.34	20 22 23.7	2.0	21.6	1.63	30	5 49.3	20 26 8.33	20 1 4.9	1.8	18.8	1.42
15	8 40.4	20 20 12.91	−20 22 57.1	2.0	21.6	1.63	31	5 45.8	20 26 33.61	−19 59 34.9	1.8	18.7	1.41
16	8 36.3	20 20 3.27	−20 23 27.8	2.0	21.5	1.63	Nov. 1	5 42.3	20 26 59.56	−19 58 2.5	1.8	18.7	1.41

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 1	15 36.6	10 24 20.12	+11 40 6.7	1.0	9.1	0.66	Feb. 15	12 29.0	10 13 39.34	+12 48 45.8	1.1	9.4	0.69
2	15 32.5	10 24 12.46	11 41 5.2	1.0	9.1	0.66	16	12 24.8	10 13 20.95	12 50 34.2	1.1	9.4	0.69
3	15 28.5	10 24 4.41	11 42 5.8	1.0	9.1	0.66	17	12 20.5	10 13 2.54	12 52 22.5	1.1	9.5	0.69
4	15 24.4	10 23 55.98	11 43 8.4	1.0	9.1	0.66	18	12 16.3	10 12 44.10	12 54 10.5	1.1	9.5	0.69
5	15 20.3	10 23 47.17	11 44 13.1	1.0	9.1	0.66	19	12 12.1	10 12 25.66	12 55 58.2	1.1	9.5	0.69
6	15 16.2	10 23 38.00	+11 45 19.8	1.0	9.2	0.67	20	12 7.8	10 12 7.22	+12 57 45.6	1.1	9.5	0.69
7	15 12.1	10 23 28.46	11 46 28.4	1.0	9.2	0.67	21	12 3.6	10 11 48.79	12 59 32.6	1.1	9.5	0.69
8	15 8.0	10 23 18.56	11 47 38.9	1.0	9.2	0.67	22	11 59.3	10 11 30.39	13 1 19.1	1.1	9.4	0.69
9	15 3.9	10 23 8.30	11 48 51.4	1.0	9.2	0.67	23	11 55.1	10 11 12.02	13 3 5.1	1.1	9.4	0.69
10	14 59.8	10 22 57.68	11 50 5.7	1.0	9.2	0.67	24	11 50.9	10 10 53.69	13 4 50.5	1.1	9.4	0.69
11	14 55.7	10 22 46.71	+11 51 21.9	1.0	9.2	0.67	25	11 46.6	10 10 35.42	+13 6 35.2	1.1	9.4	0.69
12	14 51.6	10 22 35.40	11 52 39.8	1.0	9.2	0.67	26	11 42.4	10 10 17.22	13 8 19.2	1.1	9.4	0.69
13	14 47.5	10 22 23.76	11 53 59.5	1.0	9.2	0.67	27	11 38.2	10 9 59.10	13 10 2.5	1.1	9.4	0.69
14	14 43.3	10 22 11.78	11 55 20.9	1.1	9.2	0.68	28	11 33.9	10 9 41.06	13 11 44.9	1.1	9.4	0.69
15	14 39.2	10 21 59.48	11 56 44.0	1.1	9.3	0.68	Mar. 1	11 29.7	10 9 23.11	13 13 26.4	1.1	9.4	0.69
16	14 35.1	10 21 46.86	+11 58 8.7	1.1	9.3	0.68	2	11 25.5	10 9 5.27	+13 15 7.1	1.1	9.4	0.69
17	14 30.9	10 21 33.92	11 59 34.9	1.1	9.3	0.68	3	11 21.2	10 8 47.55	13 16 46.7	1.1	9.4	0.69
18	14 26.8	10 21 20.67	12 1 2.7	1.1	9.3	0.68	4	11 17.0	10 8 29.95	13 18 25.4	1.1	9.4	0.69
19	14 22.6	10 21 7.12	12 2 32.0	1.1	9.3	0.68	5	11 12.8	10 8 12.49	13 20 3.1	1.1	9.4	0.69
20	14 18.4	10 20 53.28	12 4 2.8	1.1	9.3	0.68	6	11 8.6	10 7 55.15	13 21 39.6	1.1	9.4	0.69
21	14 14.3	10 20 39.16	+12 5 34.9	1.1	9.3	0.68	7	11 4.3	10 7 37.98	+13 23 14.9	1.1	9.4	0.69
22	14 10.1	10 20 24.76	12 7 8.5	1.1	9.3	0.68	8	11 0.1	10 7 20.97	13 24 49.0	1.1	9.4	0.69
23	14 5.9	10 20 10.09	12 8 43.2	1.1	9.3	0.68	9	10 55.9	10 7 4.13	13 26 21.9	1.1	9.4	0.69
24	14 1.8	10 19 55.17	12 10 19.2	1.1	9.3	0.68	10	10 51.7	10 6 47.46	13 27 53.6	1.1	9.4	0.69
25	13 57.6	10 19 39.99	12 11 56.4	1.1	9.4	0.68	11	10 47.5	10 6 30.98	13 29 23.9	1.1	9.4	0.69
26	13 53.4	10 19 24.57	+12 13 34.6	1.1	9.4	0.68	12	10 43.3	10 6 14.70	+13 30 52.8	1.1	9.4	0.69
27	13 49.2	10 19 8.91	12 15 13.9	1.1	9.4	0.68	13	10 39.1	10 5 58.62	13 32 20.3	1.1	9.4	0.69
28	13 45.0	10 18 53.03	12 16 54.3	1.1	9.4	0.68	14	10 34.9	10 5 42.76	13 33 46.3	1.1	9.4	0.69
29	13 40.8	10 18 36.94	12 18 35.6	1.1	9.4	0.68	15	10 30.7	10 5 27.12	13 35 10.8	1.1	9.4	0.69
30	13 36.6	10 18 20.65	12 20 17.7	1.1	9.4	0.68	16	10 26.5	10 5 11.72	13 36 33.8	1.1	9.4	0.69
31	13 32.4	10 18 4.16	+12 22 0.7	1.1	9.4	0.69	17	10 22.3	10 4 56.56	+13 37 55.1	1.1	9.3	0.69
Feb. 1	13 28.2	10 17 47.48	12 23 44.4	1.1	9.4	0.69	18	10 18.2	10 4 41.64	13 39 14.9	1.1	9.3	0.69
2	13 24.0	10 17 30.62	12 25 28.8	1.1	9.4	0.69	19	10 14.0	10 4 26.98	13 40 33.0	1.1	9.3	0.68
3	13 19.8	10 17 13.59	12 27 13.9	1.1	9.4	0.69	20	10 9.8	10 4 12.59	13 41 49.4	1.1	9.3	0.68
4	13 15.5	10 16 56.40	12 28 59.6	1.1	9.4	0.69	21	10 5.6	10 3 58.47	13 43 4.1	1.1	9.3	0.68
5	13 11.3	10 16 39.06	+12 30 45.9	1.1	9.4	0.69	22	10 1.4	10 3 44.62	+13 44 17.0	1.1	9.3	0.68
6	13 7.1	10 16 21.58	12 32 32.6	1.1	9.4	0.69	23	9 57.3	10 3 31.06	13 45 28.1	1.1	9.3	0.68
7	13 2.9	10 16 3.95	12 34 19.8	1.1	9.4	0.69	24	9 53.2	10 3 17.80	13 46 37.4	1.1	9.3	0.68
8	12 58.6	10 15 46.20	12 36 7.3	1.1	9.4	0.69	25	9 49.0	10 3 4.84	13 47 44.8	1.1	9.3	0.68
9	12 54.4	10 15 28.34	12 37 55.2	1.1	9.4	0.69	26	9 44.9	10 2 52.19	13 48 50.2	1.1	9.2	0.68
10	12 50.2	10 15 10.38	+12 39 43.3	1.1	9.4	0.69	27	9 40.8	10 2 39.86	+13 49 53.7	1.0	9.2	0.68
11	12 45.9	10 14 52.32	12 41 31.6	1.1	9.4	0.69	28	9 36.6	10 2 27.85	13 50 55.4	1.0	9.2	0.68
12	12 41.7	10 14 34.18	12 43 20.1	1.1	9.4	0.69	29	9 32.5	10 2 16.16	13 51 55.0	1.0	9.2	0.68
13	12 37.5	10 14 15.96	12 45 8.7	1.1	9.4	0.69	30	9 28.4	10 2 4.80	13 52 52.7	1.0	9.2	0.68
14	12 33.2	10 13 57.68	12 46 57.2	1.1	9.4	0.69	31	9 24.3	10 1 53.78	13 53 48.4	1.0	9.2	0.67
15	12 29.0	10 13 39.34	+12 48 45.8	1.1	9.4	0.69	Apr. 1	9 20.2	10 1 43.10	+13 54 42.1	1.0	9.2	0.67
16	12 24.8	10 13 20.95	+12 50 34.2	1.1	9.4	0.69	2	9 16.1	10 1 32.76	+13 55 33.8	1.0	9.2	0.67

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	9 20.2	10 1 43.10	+13 54 42.1	1.0	9.2	0.67	Nov. 16	19 24.3	11 10 18.85	+7 15 29.1	0.9	8.1	0.58
2	9 16.1	10 1 32.76	13 55 33.8	1.0	9.2	0.67	17	19 20.6	11 10 34.37	7 14 6.9	0.9	8.1	0.58
3	9 12.0	10 1 22.77	13 56 23.3	1.0	9.2	0.67	18	19 16.9	11 10 49.56	7 12 46.9	0.9	8.1	0.58
4	9 7.9	10 1 13.14	13 57 10.8	1.0	9.2	0.67	19	19 13.2	11 11 4.41	7 11 29.0	0.9	8.1	0.58
5	9 3.9	10 1 3.87	13 57 56.2	1.0	9.1	0.67	20	19 9.5	11 11 18.93	7 10 13.3	0.9	8.2	0.59
6	8 59.7	10 0 54.96	+13 58 39.4	1.0	9.1	0.67	21	19 5.8	11 11 33.12	+7 8 59.8	0.9	8.2	0.59
7	8 55.6	10 0 46.42	13 59 20.5	1.0	9.1	0.67	22	19 2.1	11 11 46.97	7 7 48.6	0.9	8.2	0.59
8	8 51.6	10 0 38.24	13 59 59.5	1.0	9.1	0.67	23	18 58.4	11 12 0.47	7 6 39.6	0.9	8.2	0.59
9	8 47.5	10 0 30.43	14 0 36.4	1.0	9.1	0.67	24	18 54.7	11 12 13.62	7 5 32.8	0.9	8.2	0.59
10	8 43.5	10 0 23.00	14 1 11.1	1.0	9.1	0.67	25	18 51.0	11 12 26.43	7 4 28.3	0.9	8.2	0.59
11	8 39.4	10 0 15.94	+14 1 43.7	1.0	9.0	0.66	26	18 47.3	11 12 38.89	+7 3 26.1	0.9	8.2	0.59
12	8 35.4	10 0 9.28	14 2 14.1	1.0	9.0	0.66	27	18 43.5	11 12 50.98	7 2 26.2	0.9	8.3	0.59
13	8 31.3	10 0 3.00	14 2 42.4	1.0	9.0	0.66	28	18 39.8	11 13 2.72	7 1 28.6	0.9	8.3	0.59
14	8 27.3	9 59 57.11	14 3 8.4	1.0	9.0	0.66	29	18 36.1	11 13 14.10	7 0 33.4	0.9	8.3	0.59
15	8 23.3	9 59 51.61	14 3 32.2	1.0	9.0	0.66	30	18 32.3	11 13 25.11	6 59 40.6	0.9	8.3	0.60
16	8 19.2	9 59 46.53	+14 3 53.7	1.0	9.0	0.66	Dec. 1	18 28.6	11 13 35.76	+6 58 50.1	0.9	8.3	0.60
17	8 15.2	9 59 41.83	14 4 13.0	1.0	8.9	0.66	2	18 24.8	11 13 46.03	6 58 2.1	0.9	8.3	0.60
18	8 11.2	9 59 37.53	14 4 30.1	1.0	8.9	0.66	3	18 21.0	11 13 55.93	6 57 16.5	0.9	8.3	0.60
19	8 7.2	9 59 33.63	14 4 45.0	1.0	8.9	0.66	4	18 17.2	11 14 5.46	6 56 33.3	0.9	8.4	0.60
20	8 3.3	9 59 30.14	14 4 57.6	1.0	8.9	0.65	5	18 13.5	11 14 14.60	6 55 52.6	1.0	8.4	0.60
21	7 59.3	9 59 27.06	+14 5 8.0	1.0	8.9	0.65	6	18 9.7	11 14 23.36	+6 55 14.4	1.0	8.4	0.60
22	7 55.3	9 59 24.38	14 5 16.1	1.0	8.9	0.65	7	18 5.9	11 14 31.73	6 54 38.6	1.0	8.4	0.60
23	7 51.3	9 59 22.11	14 5 22.1	1.0	8.9	0.65	8	18 2.1	11 14 39.72	6 54 5.3	1.0	8.4	0.61
24	7 47.4	9 59 20.25	14 5 25.7	1.0	8.8	0.65	9	17 58.3	11 14 47.31	6 53 34.6	1.0	8.4	0.61
25	7 43.4	9 59 18.80	14 5 27.1	1.0	8.8	0.65	10	17 54.4	11 14 54.51	6 53 6.5	1.0	8.4	0.61
26	7 39.5	9 59 17.77	+14 5 26.3	1.0	8.8	0.65	11	17 50.6	11 15 1.32	+6 52 40.8	1.0	8.5	0.61
27	7 35.5	9 59 17.14	14 5 23.2	1.0	8.8	0.65	12	17 46.8	11 15 7.72	6 52 17.7	1.0	8.5	0.61
28	7 31.6	9 59 16.92	14 5 17.9	1.0	8.8	0.64	13	17 43.0	11 15 13.72	6 51 57.2	1.0	8.5	0.61
29	7 27.7	9 59 17.11	14 5 10.4	1.0	8.8	0.64	14	17 39.1	11 15 19.33	6 51 39.3	1.0	8.5	0.61
30	7 23.7	9 59 17.71	14 5 0.6	1.0	8.7	0.64	15	17 35.3	11 15 24.53	6 51 23.9	1.0	8.5	0.61
May 1	7 19.8	9 59 18.72	+14 4 48.7	1.0	8.7	0.64	16	17 31.4	11 15 29.33	+6 51 11.1	1.0	8.5	0.62
2	7 15.9	9 59 20.13	14 4 34.5	1.0	8.7	0.64	17	17 27.6	11 15 33.72	6 51 0.9	1.0	8.5	0.62
3	7 12.0	9 59 21.95	14 4 18.2	1.0	8.7	0.64	18	17 23.7	11 15 37.71	6 50 53.3	1.0	8.6	0.62
4	7 8.1	9 59 24.18	14 3 59.6	1.0	8.7	0.64	19	17 19.8	11 15 41.30	6 50 48.3	1.0	8.6	0.62
5	7 4.2	9 59 26.81	14 3 38.9	1.0	8.7	0.64	20	17 16.0	11 15 44.48	6 50 45.8	1.0	8.6	0.62
6	7 0.3	9 59 29.85	+14 3 16.0	1.0	8.7	0.63	21	17 12.1	11 15 47.24	+6 50 45.9	1.0	8.6	0.62
7	6 56.5	9 59 33.28	14 2 50.9	1.0	8.6	0.63	22	17 8.2	11 15 49.60	6 50 48.6	1.0	8.6	0.62
8	6 52.6	9 59 37.12	14 2 23.6	1.0	8.6	0.63	23	17 4.3	11 15 51.56	6 50 53.9	1.0	8.6	0.62
9	6 48.7	9 59 41.36	14 1 54.1	1.0	8.6	0.63	24	17 0.4	11 15 53.11	6 51 1.8	1.0	8.6	0.62
10	6 44.9	9 59 46.00	14 1 22.6	1.0	8.6	0.63	25	16 56.5	11 15 54.25	6 51 12.2	1.0	8.7	0.63
11	6 41.0	9 59 51.03	+14 0 48.8	1.0	8.6	0.63	26	16 52.6	11 15 54.99	+6 51 25.1	1.0	8.7	0.63
12	6 37.2	9 59 56.47	14 0 12.9	1.0	8.6	0.63	27	16 48.6	11 15 55.32	6 51 40.7	1.0	8.7	0.63
13	6 33.3	10 0 2.30	13 59 35.0	1.0	8.5	0.63	28	16 44.7	11 15 55.24	6 51 58.8	1.0	8.7	0.63
14	6 29.5	10 0 8.53	13 58 54.9	1.0	8.5	0.62	29	16 40.8	11 15 54.74	6 52 19.4	1.0	8.7	0.63
15	6 25.7	10 0 15.15	13 57 12.8	1.0	8.5	0.62	30	16 36.8	11 15 53.84	6 52 42.5	1.0	8.8	0.63
16	6 21.9	10 0 22.17	+13 57 28.6	1.0	8.5	0.62	31	16 32.9	11 15 52.54	+6 53 8.2	1.0	8.8	0.63
17	6 18.1	10 0 29.57	+13 56 42.3	1.0	8.5	0.62	32	16 28.9	11 15 50.84	+6 53 36.5	1.0	8.8	0.63

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 15	17 56.3	13 39 37.32	−9 43 7.6	0.5	1.8	0.12	Mar. 1	14 58.2	13 38 25.95	−9 35 8.8	0.5	1.9	0.13
16	17 52.4	13 39 40.27	9 43 22.8	0.5	1.8	0.12	2	14 54.1	13 38 19.99	9 34 33.4	0.5	1.9	0.13
17	17 48.5	13 39 43.02	9 43 36.8	0.5	1.8	0.12	3	14 50.1	13 38 13.87	9 33 57.1	0.5	1.9	0.13
18	17 44.6	13 39 45.56	9 43 49.6	0.5	1.8	0.12	4	14 46.1	13 38 7.59	9 33 20.0	0.5	1.9	0.13
19	17 40.7	13 39 47.88	9 44 1.2	0.5	1.8	0.12	5	14 42.0	13 38 1.16	9 32 42.0	0.5	1.9	0.13
20	17 36.8	13 39 49.99	−9 44 11.5	0.5	1.8	0.12	6	14 38.0	13 37 54.58	−9 32 3.1	0.5	1.9	0.13
21	17 32.9	13 39 51.89	9 44 20.7	0.5	1.8	0.12	7	14 33.9	13 37 47.85	9 31 23.4	0.5	1.9	0.13
22	17 29.0	13 39 53.57	9 44 28.6	0.5	1.8	0.12	8	14 29.9	13 37 40.98	9 30 42.9	0.5	1.9	0.13
23	17 25.1	13 39 55.05	9 44 35.3	0.5	1.8	0.12	9	14 25.8	13 37 33.96	9 30 1.6	0.5	1.9	0.13
24	17 21.2	13 39 56.31	9 44 40.8	0.5	1.8	0.12	10	14 21.8	13 37 26.81	9 29 19.5	0.5	1.9	0.13
25	17 17.3	13 39 57.36	−9 44 45.1	0.5	1.8	0.12	11	14 17.7	13 37 19.52	−9 28 36.7	0.5	1.9	0.13
26	17 13.4	13 39 58.19	9 44 48.2	0.5	1.8	0.12	12	14 13.7	13 37 12.09	9 27 53.1	0.5	1.9	0.13
27	17 9.5	13 39 58.81	9 44 50.1	0.5	1.8	0.12	13	14 9.6	13 37 4.54	9 27 8.8	0.5	1.9	0.13
28	17 5.5	13 39 59.23	9 44 50.8	0.5	1.8	0.12	14	14 5.6	13 36 56.86	9 26 23.7	0.5	1.9	0.13
29	17 1.6	13 39 59.43	9 44 50.2	0.5	1.8	0.12	15	14 1.5	13 36 49.05	9 25 38.0	0.5	1.9	0.13
30	16 57.7	13 39 59.42	−9 44 48.5	0.5	1.8	0.12	16	13 57.5	13 36 41.13	−9 24 51.6	0.5	1.9	0.13
31	16 53.7	13 39 59.20	9 44 45.6	0.5	1.8	0.12	17	13 53.4	13 36 33.09	9 24 4.5	0.5	1.9	0.13
Feb. 1	16 49.8	13 39 58.78	9 44 41.5	0.5	1.8	0.12	18	13 49.3	13 36 24.94	9 23 16.8	0.5	1.9	0.13
2	16 45.8	13 39 58.14	9 44 36.2	0.5	1.8	0.13	19	13 45.3	13 36 16.68	9 22 28.5	0.5	1.9	0.13
3	16 41.9	13 39 57.30	9 44 29.7	0.5	1.9	0.13	20	13 41.2	13 36 8.31	9 21 39.7	0.5	1.9	0.13
4	16 37.9	13 39 56.25	−9 44 22.0	0.5	1.9	0.13	21	13 37.1	13 35 59.85	−9 20 50.2	0.5	1.9	0.13
5	16 34.0	13 39 54.99	9 44 13.2	0.5	1.9	0.13	22	13 33.1	13 35 51.28	9 20 0.2	0.5	1.9	0.13
6	16 30.0	13 39 53.53	9 44 3.3	0.5	1.9	0.13	23	13 29.0	13 35 42.62	9 19 9.7	0.5	1.9	0.13
7	16 26.1	13 39 51.86	9 43 52.1	0.5	1.9	0.13	24	13 24.9	13 35 33.88	9 18 18.7	0.5	1.9	0.13
8	16 22.1	13 39 49.99	9 43 39.8	0.5	1.9	0.13	25	13 20.8	13 35 25.05	9 17 27.2	0.5	1.9	0.13
9	16 18.1	13 39 47.91	−9 43 26.4	0.5	1.9	0.13	26	13 16.7	13 35 16.14	−9 16 35.3	0.5	1.9	0.13
10	16 14.2	13 39 45.63	9 43 11.8	0.5	1.9	0.13	27	13 12.6	13 35 7.15	9 15 43.0	0.5	1.9	0.13
11	16 10.2	13 39 43.15	9 42 56.0	0.5	1.9	0.13	28	13 8.6	13 34 58.09	9 14 50.3	0.5	1.9	0.13
12	16 6.2	13 39 40.48	9 42 39.2	0.5	1.9	0.13	29	13 4.5	13 34 48.97	9 13 57.2	0.5	1.9	0.13
13	16 2.2	13 39 37.60	9 42 21.2	0.5	1.9	0.13	30	13 0.4	13 34 39.77	9 13 3.7	0.5	1.9	0.13
14	15 58.3	13 39 34.52	−9 42 2.1	0.5	1.9	0.13	31	12 56.3	13 34 30.52	−9 12 9.9	0.5	1.9	0.13
15	15 54.3	13 39 31.26	9 41 41.9	0.5	1.9	0.13	Apr. 1	12 52.2	13 34 21.22	9 11 15.8	0.5	1.9	0.13
16	15 50.3	13 39 27.79	9 41 20.6	0.5	1.9	0.13	2	12 48.1	13 34 11.86	9 10 21.4	0.5	1.9	0.13
17	15 46.3	13 39 24.13	9 40 58.2	0.5	1.9	0.13	3	12 44.0	13 34 2.45	9 9 26.8	0.5	1.9	0.13
18	15 42.3	13 39 20.28	9 40 34.7	0.5	1.9	0.13	4	12 39.9	13 33 53.00	9 8 31.9	0.5	1.9	0.13
19	15 38.3	13 39 16.24	−9 40 10.1	0.5	1.9	0.13	5	12 35.9	13 33 43.51	−9 7 36.8	0.5	1.9	0.13
20	15 34.3	13 39 12.01	9 39 44.5	0.5	1.9	0.13	6	12 31.8	13 33 33.98	9 6 41.6	0.5	1.9	0.13
21	15 30.3	13 39 7.60	9 39 17.9	0.5	1.9	0.13	7	12 27.7	13 33 24.42	9 5 46.1	0.5	1.9	0.13
22	15 26.3	13 39 3.01	9 38 50.2	0.5	1.9	0.13	8	12 23.6	13 33 14.83	9 4 50.5	0.5	1.9	0.13
23	15 22.3	13 38 58.23	9 38 21.5	0.5	1.9	0.13	9	12 19.5	13 33 5.22	9 3 54.8	0.5	1.9	0.13
24	15 18.3	13 38 53.28	−9 37 51.8	0.5	1.9	0.13	10	12 15.4	13 32 55.59	−9 2 59.0	0.5	1.9	0.13
25	15 14.3	13 38 48.15	9 37 21.1	0.5	1.9	0.13	11	12 11.3	13 32 45.93	9 2 3.1	0.5	1.9	0.13
26	15 10.2	13 38 42.85	9 36 49.5	0.5	1.9	0.13	12	12 7.2	13 32 36.27	9 1 7.2	0.5	1.9	0.13
27	15 6.2	13 38 37.38	9 36 16.9	0.5	1.9	0.13	13	12 3.1	13 32 26.60	9 0 11.2	0.5	1.9	0.13
28	15 2.2	13 38 31.75	9 35 43.3	0.5	1.9	0.13	14	11 59.0	13 32 16.93	8 59 15.2	0.5	1.9	0.13
Mar. 1	14 58.2	13 38 25.95	−9 35 8.8	0.5	1.9	0.13	15	11 54.9	13 32 7.25	−8 58 19.3	0.5	1.9	0.13
2	14 54.1	13 38 19.99	−9 34 33.4	0.5	1.9	0.13	16	11 50.8	13 31 57.58	−8 57 23.4	0.5	1.9	0.13

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr.16	11 50.8	13 31 57.58	−8 57 23.4	0.5	1.9	0.13	June 1	8 43.8	13 25 46.00	−8 22 2.4	0.5	1.9	0.13
17	11 46.7	13 31 47.93	8 56 27.5	0.5	1.9	0.13	2	8 39.8	13 25 40.77	8 21 33.5	0.5	1.9	0.13
18	11 42.6	13 31 38.28	8 55 31.8	0.5	1.9	0.13	3	8 35.8	13 25 35.71	8 21 5.6	0.5	1.9	0.13
19	11 38.5	13 31 28.65	8 54 36.2	0.5	1.9	0.13	4	8 31.8	13 25 30.82	8 20 38.8	0.5	1.9	0.13
20	11 34.5	13 31 19.04	8 53 40.7	0.5	1.9	0.13	5	8 27.7	13 25 26.09	8 20 12.9	0.5	1.9	0.13
21	11 30.4	13 31 9.47	−8 52 45.5	0.5	1.9	0.13	6	8 23.7	13 25 21.53	−8 19 48.1	0.5	1.9	0.13
22	11 26.3	13 30 59.93	8 51 50.4	0.5	1.9	0.13	7	8 19.7	13 25 17.14	8 19 24.3	0.5	1.9	0.13
23	11 22.2	13 30 50.41	8 50 55.5	0.5	1.9	0.13	8	8 15.7	13 25 12.92	8 19 1.5	0.5	1.9	0.13
24	11 18.1	13 30 40.94	8 50 0.9	0.5	1.9	0.13	9	8 11.7	13 25 8.88	8 18 39.8	0.5	1.9	0.13
25	11 14.0	13 30 31.52	8 49 6.6	0.5	1.9	0.13	10	8 7.7	13 25 5.02	8 18 19.1	0.5	1.9	0.13
26	11 9.9	13 30 22.14	−8 48 12.6	0.5	1.9	0.13	11	8 3.8	13 25 1.33	−8 17 59.5	0.5	1.9	0.13
27	11 5.8	13 30 12.81	8 47 18.9	0.5	1.9	0.13	12	7 59.8	13 24 57.82	8 17 41.0	0.5	1.9	0.13
28	11 1.8	13 30 3.54	8 46 25.5	0.5	1.9	0.13	13	7 55.8	13 24 54.50	8 17 23.6	0.5	1.9	0.13
29	10 57.7	13 29 54.33	8 45 32.5	0.5	1.9	0.13	14	7 51.8	13 24 51.35	8 17 7.2	0.5	1.9	0.13
30	10 53.6	13 29 45.18	8 44 39.9	0.5	1.9	0.13	15	7 47.8	13 24 48.39	8 16 52.0	0.5	1.9	0.13
May 1	10 49.5	13 29 36.09	−8 43 47.7	0.5	1.9	0.13	16	7 43.8	13 24 45.62	−8 16 37.9	0.5	1.9	0.13
2	10 45.4	13 29 27.08	8 42 55.9	0.5	1.9	0.13	17	7 39.9	13 24 43.04	8 16 24.9	0.5	1.9	0.13
3	10 41.4	13 29 18.14	8 42 4.6	0.5	1.9	0.13	18	7 35.9	13 24 40.65	8 16 13.0	0.5	1.9	0.13
4	10 37.3	13 29 9.28	8 41 13.8	0.5	1.9	0.13	19	7 31.9	13 24 38.44	8 16 2.3	0.5	1.9	0.13
5	10 33.2	13 29 0.49	8 40 23.5	0.5	1.9	0.13	20	7 28.0	13 24 36.42	8 15 52.8	0.5	1.9	0.13
6	10 29.1	13 28 51.79	−8 39 33.6	0.5	1.9	0.13	21	7 24.0	13 24 34.60	−8 15 44.3	0.5	1.9	0.13
7	10 25.0	13 28 43.18	8 38 44.4	0.5	1.9	0.13	22	7 20.0	13 24 32.97	8 15 37.1	0.5	1.9	0.13
8	10 21.0	13 28 34.66	8 37 55.6	0.5	1.9	0.13	23	7 16.1	13 24 31.53	8 15 30.9	0.5	1.9	0.13
9	10 16.9	13 28 26.24	8 37 7.4	0.5	1.9	0.13	24	7 12.1	13 24 30.28	8 15 26.0	0.5	1.9	0.13
10	10 12.8	13 28 17.91	8 36 19.8	0.5	1.9	0.13	25	7 8.2	13 24 29.23	8 15 22.2	0.5	1.9	0.12
11	10 8.8	13 28 9.68	−8 35 32.9	0.5	1.9	0.13	26	7 4.2	13 24 28.37	−8 15 19.5	0.5	1.9	0.12
12	10 4.7	13 28 1.56	8 34 46.6	0.5	1.9	0.13	27	7 0.3	13 24 27.71	8 15 18.0	0.5	1.8	0.12
13	10 0.6	13 27 53.55	8 34 0.9	0.5	1.9	0.13	28	6 56.4	13 24 27.24	8 15 17.7	0.5	1.8	0.12
14	9 56.6	13 27 45.64	8 33 15.9	0.5	1.9	0.13	29	6 52.4	13 24 26.97	8 15 18.5	0.5	1.8	0.12
15	9 52.5	13 27 37.86	8 32 31.6	0.5	1.9	0.13	30	6 48.5	13 24 26.89	8 15 20.5	0.5	1.8	0.12
16	9 48.5	13 27 30.19	−8 31 48.0	0.5	1.9	0.13	July 1	6 44.5	13 24 27.01	−8 15 23.7	0.5	1.8	0.12
17	9 44.4	13 27 22.64	8 31 5.1	0.5	1.9	0.13	2	6 40.6	13 24 27.32	8 15 28.0	0.5	1.8	0.12
18	9 40.3	13 27 15.21	8 30 23.0	0.5	1.9	0.13	3	6 36.7	13 24 27.82	8 15 33.5	0.5	1.8	0.12
19	9 36.3	13 27 7.92	8 29 41.7	0.5	1.9	0.13	4	6 32.8	13 24 28.52	8 15 40.1	0.5	1.8	0.12
20	9 32.2	13 27 0.76	8 29 1.1	0.5	1.9	0.13	5	6 28.8	13 24 29.42	8 15 47.9	0.5	1.8	0.12
21	9 28.2	13 26 53.72	−8 28 21.4	0.5	1.9	0.13	6	6 24.9	13 24 30.51	−8 15 56.9	0.5	1.8	0.12
22	9 24.1	13 26 46.83	8 27 42.5	0.5	1.9	0.13	7	6 21.0	13 24 31.80	8 16 7.0	0.5	1.8	0.12
23	9 20.1	13 26 40.08	8 27 4.4	0.5	1.9	0.13	8	6 17.1	13 24 33.28	8 16 18.3	0.5	1.8	0.12
24	9 16.1	13 26 33.47	8 26 27.2	0.5	1.9	0.13	9	6 13.2	13 24 34.96	8 16 30.7	0.5	1.8	0.12
25	9 12.0	13 26 27.00	8 25 50.9	0.5	1.9	0.13	10	6 9.3	13 24 36.84	8 16 44.3	0.5	1.8	0.12
26	9 8.0	13 26 20.68	−8 25 15.5	0.5	1.9	0.13	11	6 5.4	13 24 38.92	−8 16 59.1	0.5	1.8	0.12
27	9 4.0	13 26 14.52	8 24 41.0	0.5	1.9	0.13	12	6 1.5	13 24 41.19	8 17 15.1	0.5	1.8	0.12
28	8 59.9	13 26 8.50	8 24 7.4	0.5	1.9	0.13	13	5 57.6	13 24 43.65	8 17 32.2	0.5	1.8	0.12
29	8 55.9	13 26 2.64	8 23 34.7	0.5	1.9	0.13	14	5 53.7	13 24 46.31	8 17 50.4	0.5	1.8	0.12
30	8 51.9	13 25 56.93	8 23 3.0	0.5	1.9	0.13	15	5 49.9	13 24 49.17	8 18 9.8	0.5	1.8	0.12
31	8 47.8	13 25 51.39	−8 22 32.2	0.5	1.9	0.13	16	5 46.0	13 24 52.22	−8 18 30.3	0.5	1.8	0.12
June 1	8 43.8	13 25 46.00	−8 22 2.4	0.5	1.9	0.13	17	5 42.1	13 24 55.47	−8 18 52.0	0.5	1.8	0.12

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Jan. 1	9 15.1	4 1 47.55	+18 57 32.3	0.3	1.3	0.09
2	9 11.0	4 1 42.51	18 57 20.7	0.3	1.3	0.09
3	9 7.0	4 1 37.57	18 57 9.3	0.3	1.3	0.09
4	9 3.0	4 1 32.73	18 56 58.3	0.3	1.3	0.09
5	8 59.0	4 1 27.99	18 56 47.6	0.3	1.3	0.09
6	8 55.0	4 1 23.35	+18 56 37.2	0.3	1.3	0.09
7	8 51.0	4 1 18.83	18 56 27.2	0.3	1.3	0.09
8	8 47.0	4 1 14.42	18 56 17.6	0.3	1.3	0.09
9	8 43.0	4 1 10.11	18 56 8.3	0.3	1.3	0.09
10	8 39.0	4 1 5.92	18 55 59.3	0.3	1.3	0.09
11	8 35.0	4 1 1.85	+18 55 50.7	0.3	1.3	0.09
12	8 31.0	4 0 57.88	18 55 42.4	0.3	1.3	0.09
13	8 27.0	4 0 54.03	18 55 34.5	0.3	1.3	0.09
14	8 23.0	4 0 50.30	18 55 27.0	0.3	1.3	0.09
15	8 19.0	4 0 46.70	18 55 19.9	0.3	1.3	0.09
16	8 15.0	4 0 43.22	+18 55 13.2	0.3	1.3	0.09
17	8 11.0	4 0 39.86	18 55 6.8	0.3	1.3	0.09
18	8 7.1	4 0 36.63	18 55 0.9	0.3	1.3	0.09
19	8 3.1	4 0 33.52	18 54 55.3	0.3	1.3	0.09
20	7 59.1	4 0 30.54	18 54 50.1	0.3	1.3	0.09
21	7 55.1	4 0 27.69	+18 54 45.3	0.3	1.3	0.09
22	7 51.1	4 0 24.97	18 54 40.9	0.3	1.3	0.09
23	7 47.2	4 0 22.38	18 54 37.0	0.3	1.3	0.09
24	7 43.2	4 0 19.93	18 54 33.4	0.3	1.3	0.09
25	7 39.2	4 0 17.61	18 54 30.3	0.3	1.3	0.09
26	7 35.2	4 0 15.43	+18 54 27.5	0.3	1.3	0.09
27	7 31.3	4 0 13.38	18 54 25.2	0.3	1.3	0.09
28	7 27.3	4 0 11.46	18 54 23.3	0.3	1.3	0.09
29	7 23.4	4 0 9.69	18 54 21.8	0.3	1.3	0.09
30	7 19.4	4 0 8.05	18 54 20.7	0.3	1.3	0.09
31	7 15.4	4 0 6.55	+18 54 20.0	0.3	1.3	0.09
Feb. 1	7 11.5	4 0 5.18	18 54 19.7	0.3	1.3	0.09
2	7 7.5	4 0 3.96	18 54 19.9	0.3	1.3	0.09
3	7 3.6	4 0 2.88	18 54 20.4	0.3	1.3	0.09
4	6 59.6	4 0 1.94	18 54 21.4	0.3	1.3	0.09
5	6 55.7	4 0 1.13	+18 54 22.8	0.3	1.3	0.09
6	6 51.7	4 0 0.47	18 54 24.7	0.3	1.3	0.09
7	6 47.8	3 59 59.95	18 54 26.9	0.3	1.3	0.09
8	6 43.9	3 59 59.57	18 54 29.6	0.3	1.3	0.09
9	6 39.9	3 59 59.33	18 54 32.6	0.3	1.3	0.09
10	6 36.0	3 59 59.24	+18 54 36.1	0.3	1.3	0.09
11	6 32.1	3 59 59.29	18 54 40.0	0.3	1.3	0.09
12	6 28.1	3 59 59.48	18 54 44.3	0.3	1.3	0.09
13	6 24.2	3 59 59.81	18 54 49.1	0.3	1.3	0.09
14	6 20.3	4 0 0.28	18 54 54.2	0.3	1.3	0.09
15	6 16.4	4 0 0.90	+18 54 59.8	0.3	1.3	0.09
16	6 12.5	4 0 1.67	+18 55 5.8	0.3	1.3	0.09
Feb. 15	6 16.4	4 0 0.90	+18 54 59.8	0.3	1.3	0.09
16	6 12.5	4 0 1.67	18 55 5.8	0.3	1.3	0.09
17	6 8.5	4 0 2.58	18 55 12.2	0.3	1.3	0.09
18	6 4.6	4 0 3.63	18 55 19.0	0.3	1.3	0.09
19	6 0.7	4 0 4.82	18 55 26.2	0.3	1.3	0.09
20	5 56.8	4 0 6.15	+18 55 33.8	0.3	1.3	0.09
21	5 52.9	4 0 7.63	18 55 41.8	0.3	1.3	0.09
22	5 49.0	4 0 9.24	18 55 50.2	0.3	1.3	0.09
23	5 45.1	4 0 11.01	18 55 59.1	0.3	1.3	0.09
24	5 41.2	4 0 12.91	18 56 8.3	0.3	1.3	0.09
25	5 37.3	4 0 14.96	+18 56 17.9	0.3	1.3	0.09
26	5 33.4	4 0 17.15	18 56 27.9	0.3	1.3	0.09
27	5 29.5	4 0 19.47	18 56 38.3	0.3	1.3	0.09
28	5 25.6	4 0 21.93	18 56 49.1	0.3	1.3	0.09
Mar. 1	5 21.7	4 0 24.54	18 57 0.3	0.3	1.3	0.09
Sept. 1	17 34.9	4 21 0.79	+19 51 21.3	0.3	1.3	0.09
2	17 31.0	4 21 1.75	19 51 20.5	0.3	1.3	0.09
3	17 27.1	4 21 2.58	19 51 19.4	0.3	1.3	0.09
4	17 23.1	4 21 3.26	19 51 17.9	0.3	1.3	0.09
5	17 19.2	4 21 3.81	19 51 16.2	0.3	1.3	0.09
6	17 15.3	4 21 4.22	+19 51 14.1	0.3	1.3	0.09
7	17 11.3	4 21 4.49	19 51 11.7	0.3	1.3	0.09
8	17 7.4	4 21 4.62	19 51 9.0	0.3	1.3	0.09
9	17 3.5	4 21 4.62	19 51 5.9	0.3	1.3	0.09
10	16 59.5	4 21 4.46	19 51 2.5	0.3	1.3	0.09
11	16 55.6	4 21 4.16	+19 50 58.8	0.3	1.3	0.09
12	16 51.7	4 21 3.73	19 50 54.7	0.3	1.3	0.09
13	16 47.7	4 21 3.16	19 50 50.3	0.3	1.3	0.09
14	16 43.8	4 21 2.45	19 50 45.6	0.3	1.3	0.09
15	16 39.8	4 21 1.61	19 50 40.6	0.3	1.3	0.09
16	16 35.9	4 21 0.63	+19 50 35.3	0.3	1.3	0.09
17	16 31.9	4 20 59.51	19 50 29.7	0.3	1.3	0.09
18	16 28.0	4 20 58.25	19 50 23.8	0.3	1.3	0.09
19	16 24.0	4 20 56.85	19 50 17.5	0.3	1.3	0.09
20	16 20.1	4 20 55.32	19 50 10.9	0.3	1.3	0.09
21	16 16.1	4 20 53.65	+19 50 4.0	0.3	1.3	0.09
22	16 12.1	4 20 51.85	19 49 56.9	0.3	1.3	0.09
23	16 8.2	4 20 49.92	19 49 49.4	0.3	1.3	0.09
24	16 4.2	4 20 47.86	19 49 41.6	0.3	1.3	0.09
25	16 0.3	4 20 45.66	19 49 33.6	0.3	1.3	0.09
26	15 56.3	4 20 43.33	+19 49 25.2	0.3	1.3	0.09
27	15 52.3	4 20 40.86	19 49 16.5	0.3	1.3	0.09
28	15 48.3	4 20 38.27	19 49 7.6	0.3	1.3	0.09
29	15 44.4	4 20 35.56	19 48 58.4	0.3	1.3	0.09
30	15 40.4	4 20 32.72	19 48 48.9	0.3	1.3	0.09
Oct. 1	15 36.4	4 20 29.75	+19 48 39.2	0.3	1.3	0.09
2	15 32.4	4 20 26.66	+19 48 29.1	0.3	1.3	0.09

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Oct. 1	15 36.4	4 20 29.75	+19 48 39.2	0.3	1.3	0.09
2	15 32.4	4 20 26.66	19 48 29.1	0.3	1.3	0.09
3	15 28.4	4 20 23.44	19 48 18.8	0.3	1.3	0.09
4	15 24.4	4 20 20.10	19 48 8.2	0.3	1.3	0.09
5	15 20.4	4 20 16.62	19 47 57.4	0.3	1.3	0.09
6	15 16.4	4 20 13.02	+19 47 46.2	0.3	1.3	0.09
7	15 12.5	4 20 9.33	19 47 34.8	0.3	1.3	0.09
8	15 8.5	4 20 5.51	19 47 23.2	0.3	1.3	0.09
9	15 4.5	4 20 1.57	19 47 11.3	0.3	1.3	0.09
10	15 0.5	4 19 57.52	19 46 59.2	0.3	1.3	0.09
11	14 56.5	4 19 53.35	+19 46 46.9	0.3	1.3	0.09
12	14 52.5	4 19 49.06	19 46 34.3	0.3	1.3	0.09
13	14 48.5	4 19 44.66	19 46 21.4	0.3	1.3	0.09
14	14 44.5	4 19 40.15	19 46 8.3	0.3	1.3	0.09
15	14 40.4	4 19 35.54	19 45 55.0	0.3	1.3	0.09
16	14 36.4	4 19 30.83	+19 45 41.4	0.3	1.3	0.09
17	14 32.4	4 19 26.01	19 45 27.7	0.3	1.3	0.09
18	14 28.4	4 19 21.10	19 45 13.8	0.3	1.3	0.09
19	14 24.4	4 19 16.08	19 44 59.6	0.3	1.3	0.09
20	14 20.4	4 19 10.95	19 44 45.2	0.3	1.3	0.09
21	14 16.4	4 19 5.73	+19 44 30.6	0.3	1.3	0.09
22	14 12.3	4 19 0.42	19 44 15.9	0.3	1.3	0.09
23	14 8.3	4 18 55.02	19 44 1.0	0.3	1.3	0.09
24	14 4.3	4 18 49.54	19 43 45.9	0.3	1.3	0.09
25	14 0.3	4 18 43.97	19 43 30.6	0.3	1.3	0.09
26	13 56.2	4 18 38.31	+19 43 15.2	0.3	1.3	0.09
27	13 52.2	4 18 32.57	19 42 59.6	0.3	1.3	0.09
28	13 48.2	4 18 26.74	19 42 43.8	0.3	1.3	0.09
29	13 44.2	4 18 20.83	19 42 27.9	0.3	1.3	0.09
30	13 40.1	4 18 14.84	19 42 11.8	0.3	1.3	0.09
31	13 36.1	4 18 8.79	+19 41 55.6	0.3	1.3	0.09
Nov. 1	13 32.1	4 18 2.67	19 41 39.3	0.3	1.3	0.09
2	13 28.0	4 17 56.48	19 41 22.9	0.3	1.3	0.09
3	13 24.0	4 17 50.22	19 41 6.3	0.3	1.3	0.09
4	13 20.0	4 17 43.90	19 40 49.6	0.3	1.3	0.09
5	13 15.9	4 17 37.50	+19 40 32.7	0.3	1.3	0.09
6	13 11.9	4 17 31.04	19 40 15.7	0.3	1.3	0.09
7	13 7.8	4 17 24.52	19 39 58.7	0.3	1.3	0.09
8	13 3.8	4 17 17.96	19 39 41.6	0.3	1.3	0.09
9	12 59.8	4 17 11.35	19 39 24.4	0.3	1.3	0.09
10	12 55.7	4 17 4.69	+19 39 7.1	0.3	1.3	0.09
11	12 51.7	4 16 57.98	19 38 49.8	0.3	1.3	0.09
12	12 47.6	4 16 51.22	19 38 32.3	0.3	1.3	0.09
13	12 43.6	4 16 44.41	19 38 14.8	0.3	1.3	0.09
14	12 39.5	4 16 37.56	19 37 57.2	0.3	1.3	0.09
15	12 35.5	4 16 30.68	+19 37 39.6	0.3	1.3	0.09
16	12 31.5	4 16 23.78	+19 37 22.0	0.3	1.3	0.09
Nov. 16	12 31.5	4 16 23.78	+19 37 22.0	0.3	1.3	0.09
17	12 27.4	4 16 16.85	19 37 4.4	0.3	1.3	0.09
18	12 23.4	4 16 9.89	19 36 46.7	0.3	1.3	0.09
19	12 19.3	4 16 2.90	19 36 29.0	0.3	1.3	0.09
20	12 15.3	4 15 55.89	19 36 11.3	0.3	1.3	0.09
21	12 11.2	4 15 48.86	+19 35 53.6	0.3	1.3	0.09
22	12 7.2	4 15 41.81	19 35 35.9	0.3	1.3	0.09
23	12 3.1	4 15 34.76	19 35 18.2	0.3	1.3	0.09
24	11 59.1	4 15 27.70	19 35 0.6	0.3	1.3	0.09
25	11 55.0	4 15 20.63	19 34 43.0	0.3	1.3	0.09
26	11 51.0	4 15 13.56	+19 34 25.4	0.3	1.3	0.09
27	11 46.9	4 15 6.48	19 34 7.9	0.3	1.3	0.09
28	11 42.9	4 14 59.40	19 33 50.4	0.3	1.3	0.09
29	11 38.8	4 14 52.31	19 33 32.9	0.3	1.3	0.09
30	11 34.8	4 14 45.23	19 33 15.5	0.3	1.3	0.09
Dec. 1	11 30.7	4 14 38.17	+19 32 58.2	0.3	1.3	0.09
2	11 26.7	4 14 31.13	19 32 40.9	0.3	1.3	0.09
3	11 22.6	4 14 24.10	19 32 23.8	0.3	1.3	0.09
4	11 18.6	4 14 17.09	19 32 6.7	0.3	1.3	0.09
5	11 14.5	4 14 10.10	19 31 49.8	0.3	1.3	0.09
6	11 10.5	4 14 3.13	+19 31 32.9	0.3	1.3	0.09
7	11 6.4	4 13 56.18	19 31 16.1	0.3	1.3	0.09
8	11 2.4	4 13 49.25	19 30 59.4	0.3	1.3	0.09
9	10 58.3	4 13 42.36	19 30 42.9	0.3	1.3	0.09
10	10 54.3	4 13 35.52	19 30 26.6	0.3	1.3	0.09
11	10 50.2	4 13 28.71	+19 30 10.3	0.3	1.3	0.09
12	10 46.2	4 13 21.94	19 29 54.3	0.3	1.3	0.09
13	10 42.2	4 13 15.22	19 29 38.4	0.3	1.3	0.09
14	10 38.1	4 13 8.54	19 29 22.6	0.3	1.3	0.09
15	10 34.1	4 13 1.90	19 29 7.0	0.3	1.3	0.09
16	10 30.0	4 12 55.31	+19 28 51.6	0.3	1.3	0.09
17	10 26.0	4 12 48.79	19 28 36.4	0.3	1.3	0.09
18	10 22.0	4 12 42.33	19 28 21.4	0.3	1.3	0.09
19	10 17.9	4 12 35.93	19 28 6.6	0.3	1.3	0.09
20	10 13.9	4 12 29.60	19 27 52.0	0.3	1.3	0.09
21	10 9.8	4 12 23.32	+19 27 37.6	0.3	1.3	0.09
22	10 5.8	4 12 17.11	19 27 23.4	0.3	1.3	0.09
23	10 1.8	4 12 10.96	19 27 9.4	0.3	1.3	0.09
24	9 57.8	4 12 4.89	19 26 55.7	0.3	1.3	0.09
25	9 53.7	4 11 58.89	19 26 42.2	0.3	1.3	0.09
26	9 49.7	4 11 52.98	+19 26 29.0	0.3	1.3	0.09
27	9 45.7	4 11 47.15	19 26 16.1	0.3	1.3	0.09
28	9 41.6	4 11 41.40	19 26 3.3	0.3	1.3	0.09
29	9 37.6	4 11 35.74	19 25 50.8	0.3	1.3	0.09
30	9 33.6	4 11 30.15	19 25 38.6	0.3	1.3	0.09
31	9 29.5	4 11 24.65	+19 25 26.6	0.3	1.3	0.09
32	9 25.5	4 11 19.24	+19 25 15.0	0.3	1.3	0.09

PART III

PHENOMENA

ECLIPSES IN 1890.

In the year 1890 there will be three eclipses, two of the sun and one of the moon, and a Lunar Appulse.

A Lunar Appulse, 1890, June 2, the moon being visible at Washington.

Greenwich mean time of ☍ in right ascension, $2^{\mathrm{d}}\ 18^{\mathrm{h}}\ 19^{\mathrm{m}}\ 44^{\mathrm{s}}.6$

Greenwich mean time of nearest approach, $18^{\mathrm{h}}\ 45^{\mathrm{m}}.1$

Angle of position of point of nearest approach from north point 167° to West.

The nearness of the approach and the uncertainty as to the effect of the earth's atmosphere render it doubtful whether the moon will enter the shadow of the earth or not.

I.—*An Annular Eclipse of the Sun*, 1890, June 16–17, invisible at Washington.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☌ in right ascension, June $16^{\mathrm{d}}\ 21^{\mathrm{h}}\ 58^{\mathrm{m}}\ 30^{\mathrm{s}}.7$

Sun and moon's R. A.	$5^{\mathrm{h}}\ 43^{\mathrm{m}}\ 1^{\mathrm{s}}.45$	Hourly motions	$10^{\mathrm{s}}.40$ and $132^{\mathrm{s}}.11$
Sun's declination	23° 21′ 46″.6 N.	Hourly motion	0′ 4″.2 N.
Moon's declination	23 36 8.3 N.	Hourly motion	3 42.0 N.
Sun's equa. hor. parallax	8.4	Sun's true semidiameter	15 44.5
Moon's equa. hor. parallax	54 46.0	Moon's true semidiameter	14 54.7

CIRCUMSTANCES OF THE ECLIPSE.

		d h m	Longitude from Greenwich. ° ′	Latitude. ° ′
Eclipse begins	June	16 18 55.0	13 55.6 W.	0 43.5 N.
Central eclipse begins		16 20 1.5	32 25.5 W.	5 3.9 N.
Central eclipse at noon		16 21 58.5	30 31.2 E.	36 40.4 N.
Central eclipse ends		16 23 48.7	101 25.8 E.	18 43.2 N.
Eclipse ends		17 0 55.2	82 43.4 E.	14 23.9 N.

II.—*A Partial Eclipse of the Moon*, 1890, November 25–26, invisible at Washington; but visible generally in Asia, India, and the Pacific Ocean.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☍ in right ascension, November 26ᵈ 1ʰ 1ᵐ 9ˢ.7

	h m s			s	
Sun's right ascension	16 9 7.57		Hourly motion	10.66	
Moon's right ascension	4 9 7.57		Hourly motion	134.94	
	° ′ ″			′ ″	
Sun's declination	21 0 37.4	S.	Hourly motion	0 28.1	S.
Moon's declination	20 1 20.4	N.	Hourly motion	9 0.1	N.
Sun's equa. hor. parallax	8.7		Sun's true semidiameter	16 13.0	
Moon's equa. hor. parallax	56 55.9		Moon's true semidiameter	15 30.0	

TIMES OF THE PHASES.

	Greenwich Mean Time.		Washington Mean Time.	
		d h m		d h m
Moon enters penumbra	November	25 23 15.8	November	25 18 7.6
Moon enters shadow		26 1 25.4		25 20 17.2
Middle of the eclipse		26 1 33.8		25 20 25.6
Moon leaves shadow		26 1 42.1		25 20 33.9
Moon leaves penumbra		26 3 51.7		25 22 43.5

CIRCUMSTANCES OF THE ECLIPSE.

Contacts of Shadow with moon's limb.	Angles of position from north point.	The moon being in the zenith in longitude from Greenwich	and in latitude.
First	12° to W.	155° 48′ E.	20° 5′ N.
Last	20 to W.	151 50 E.	20 7 N.

Magnitude of the eclipse = 0.005, (moon's diameter = 1).

III.—*A Central Eclipse of the Sun*, 1890, December 11, invisible at Washington.

This eclipse will be annular at the beginning and end; and total between $13^h 55^m.3$ and $16^h 20^m.5$, Greenwich mean time.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☌ in right ascension, December 11ᵈ 15ʰ 14ᵐ 56ˢ.7

	h m s			s s	
Sun and moon's R. A.	17 16 53.22		Hourly motions	11.03 and 152.85	
	° ′ ″			′ ″	
Sun's declination	23 5 2.3	S.	Hourly motion	0 11.4	S.
Moon's declination	23 35 6.0	S.	Hourly motion	5 52.7	S.
Sun's equa. hor. parallax	8.7		Sun's true semidiameter	16 15.0	
Moon's equa. hor. parallax	59 8.2		Moon's true semidiameter	16 6.1	

CIRCUMSTANCES OF THE ECLIPSE.

	Greenwich Mean Time.		Longitude from Greenwich.	Latitude.
		d h m	° ′	° ′
Eclipse begins	December	11 12 28.3	77 49.0 E.	8 16.4 S.
Central eclipse begins		11 13 32.7	57 0.1 E.	18 37.0 S.
Central eclipse at noon		11 15 14.9	129 42.5 E.	53 58.6 S.
Central eclipse ends		11 16 38.2	142 45.6 W.	36 26.3 S.
Eclipse ends		11 17 42.7	164 59.0 W.	26 25.2 S.

The regions within which the eclipses of the sun are visible, are laid down on the accompanying charts, from which, by means of the dotted lines, may also be found the Greenwich time of beginning and ending within fifteen or twenty minutes.

BESSELIAN ELEMENTS OF THE ANNULAR ECLIPSE OF THE SUN, 1890, JUNE 16—17.

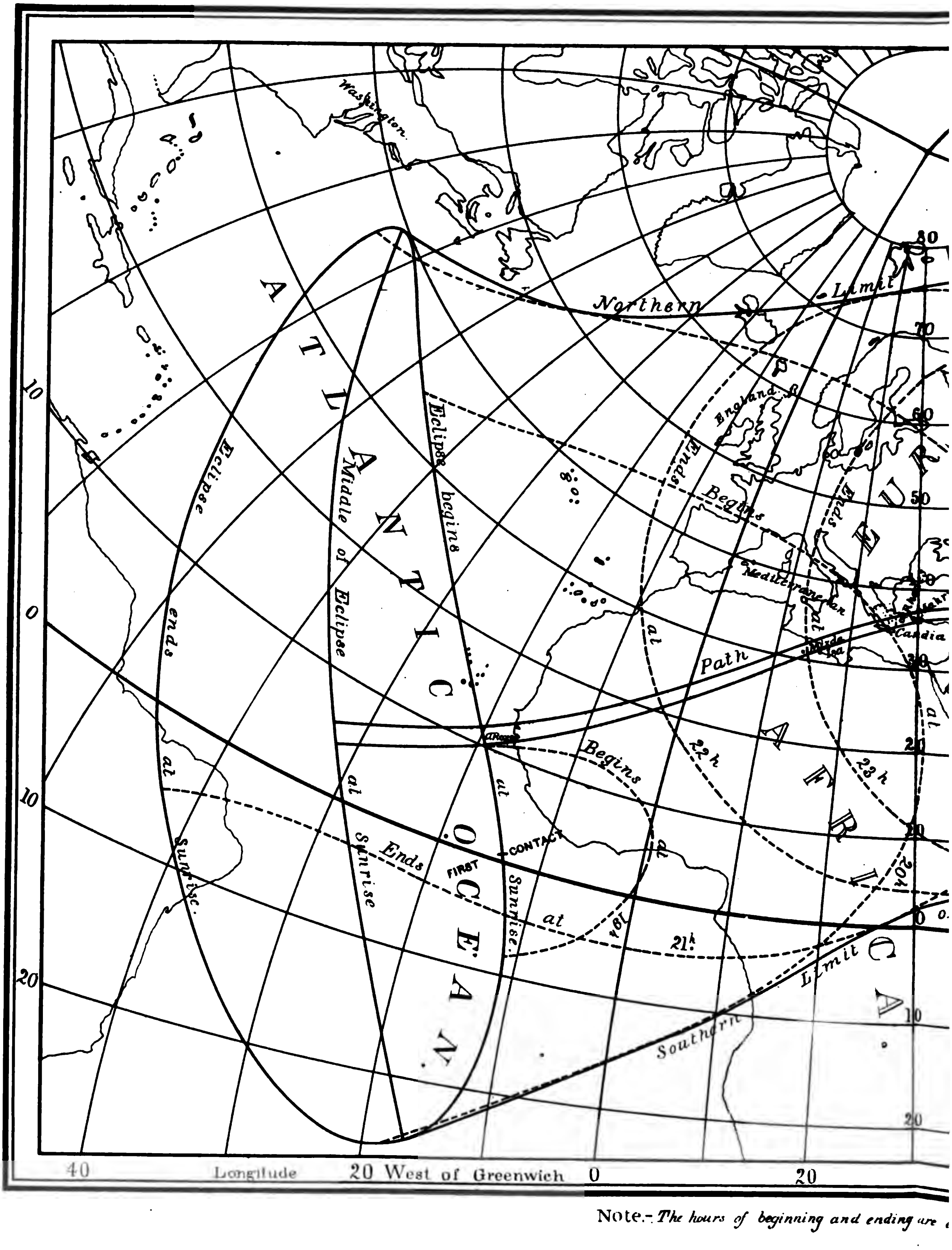
Greenwich Mean Time.	Co-ordinates of Centre of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra and Shadow on Fundamental Plane.	
	x	*y*	Log sin *d*	Log cos *d*	*μ*	*l*	*l'*
h m					° ′		
18 50	−1.60343	+0.01574	+9.59882	+9.96275	282 21.3	+0.56082	+0.01488
19 0	−1.51840	+0.02699	+9.59882	+9.96275	284 51.3	+0.56084	+0.01490
10	1.43336	0.03823	9.59882	9.96275	287 21.3	0.56087	0.01492
20	1.34832	0.04946	9.59883	9.96275	289 51.3	0.56089	0.01494
30	1.26327	0.06068	9.59883	9.96275	292 21.3	0.56091	0.01496
40	1.17822	0.07189	9.59883	9.96275	294 51.3	0.56093	0.01498
50	1.09317	0.08309	9.59884	9.96275	297 21.2	0.56095	0.01500
20 0	−1.00812	+0.09429	+9.59884	+9.96275	299 51.2	+0.56097	+0.01502
10	0.92307	0.10548	9.59884	9.96275	302 21.2	0.56099	0.01504
20	0 83801	0.11666	9.59885	9.96275	304 51.2	0.56101	0.01506
30	0.75295	0.12783	9.59885	9.96275	307 21.2	0.56103	0.01508
40	0.66789	0.13899	9.59885	9.96275	309 51.2	0.56104	0.01510
50	0 58283	0.15014	9.59886	9.96274	312 21.2	0.56106	0.01512
21 0	−0.49777	+0.16128	+9.59886	+9.96274	314 51.2	+0.56107	+0.01513
10	0.41270	0.17241	9.59886	9.96274	317 21.2	0.56109	0.01515
20	0.32763	0.18353	9.59887	9.96274	319 51.2	0.56110	0.01516
30	0.24256	0.19464	9.59887	9.96274	322 21.1	0.56112	0.01518
40	0.15749	0.20575	9.59887	9.96274	324 51.1	0.56113	0.01519
50	−0.07242	0.21685	9.59887	9.96274	327 21.1	0.56115	0.01520
22 0	+0.01266	+0.22794	+9.59888	+9.96274	329 51.1	+0.56116	+0.01521
10	0.09774	0.23902	9.59888	9.96274	332 21.1	0.56117	0.01522
20	0.18282	0.25009	9.59888	9.96274	334 51.1	0.56118	0.01523
30	0.26790	0.26115	9.59888	9.96274	337 21.1	0.56119	0.01524
40	0.35297	0.27220	9.59889	9.96274	339 51.1	0.56120	0.01525
50	0.43805	0.28325	9.59889	9.96274	342 21 1	0.56121	0.01526
23 0	+0.52312	+0.29429	+9.59889	+9.96274	344 51.1	+0.56122	+0.01527
10	0.60820	0.30531	9.59889	9.96274	347 21.1	0.56123	0 01528
20	0.69327	0.31632	9.59890	9.96274	349 51.0	0.56124	0 01529
30	0.77835	0.32732	9.59890	9.96274	352 21.0	0.56125	0 01530
40	0.86342	0.33832	9.59890	9.96273	354 51.0	0.56126	0.01531
50	0.94849	0.34931	9.59891	9.96273	357 21.0	0.56126	0.01531
0 0	+1.03356	+0.36029	+9.59891	+9.96273	359 51.0	+0 56127	+0.01532
10	1.11862	0.37126	9.59891	9.96273	2 21.0	0 56127	0 01532
20	1.20368	0.38222	9.59892	9.96273	4 51.0	0.56128	0.01533
30	1.28874	0.39317	9.59892	9.96273	7 21.0	0.56128	0.01533
40	1.37380	0.40411	9.59892	9.96273	9 51.0	0.56128	0.01533
50	1.45886	0.41504	9.59893	9.96273	12 21.0	0.56129	0.01534
1 0	+1.54391	+0.42597	+9.59893	+9.96273	14 50.9	+0.56129	+0.01534

Greenwich Mean Time.	Log Δ *x* for 1 Minute.	Log Δ *y* for 1 Minute.	Log Δ *μ* for 1 Minute.	Log Tangents of Angles of Cones—	
				Penumbra.	Shadow.
h m					
18 0	+7.9295	+7.0526	+1.1761	+7.66295	+7.66083
19 0	7.9296	7.0509	1.1761	7.66295	7.66083
20 0	7.9297	7.0489	1.1761	7.66294	7.66083
21 0	7.9298	7.0468	1.1761	7.66294	7.66083
22 0	7.9298	7.0448	1.1761	7.66294	7.66083
23 0	7.9298	7.0425	1.1761	7.66294	7.66083
0 0	7.9298	7.0403	1.1761	7.66294	7.66083
1 0	+7.9297	+7.0382	+1.1761	+7.66294	+7.66083

PATH OF THE ANNULUS DURING THE ANNULAR ECLIPSE OF THE SUN, 1890, JUNE 16—17.

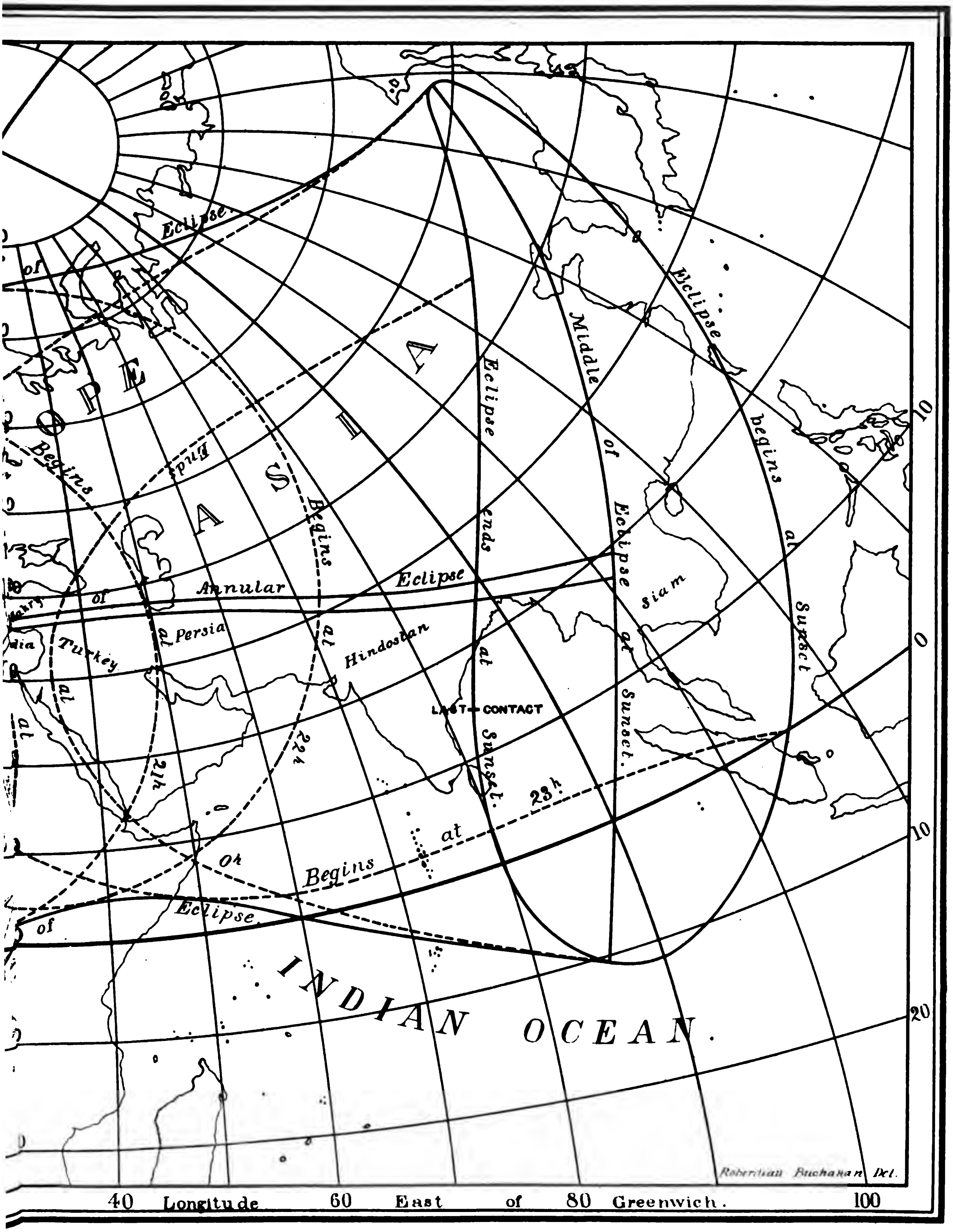
Greenwich Mean Time.	Northern Limit of Annulus Path.		Central Line.		Southern Limit of Annulus Path.		Duration of Annulus on Central Line.
	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	
	° ′	° ′	° ′	° ′	° ′	° ′	m s
Limits	+ 5 53.8	32 58.4 W.	+ 5 3.9	32 25.5 W.	+ 4 16.1	31 54.0 W.	
20h 5m	10 55.8	21 58.6	10 47.9	20 20.4	10 39.9	18 42.2	3 23.5
10	14 30.1	15 39.8	14 11.1	14 30.6	13 52.1	13 21.3	3 27.7
15	17 1.8	11 19.6	16 38.9	10 21.5	16 16.1	9 23.4	3 31.1
20	19 6.6	7 53.3	18 41.6	7 1.8	18 16.6	6 10.2	3 34.2
25	20 54.8	4 57.8	20 28.4	4 10.8	20 2.1	3 23.8	3 37.2
30	+22 31.2	2 21.9	+22 3.8	1 38 4 W.	+21 36.4	0 54.9 W.	3 40.0
35	23 58.9	0 1.3 W.	23 30.6	0 39.4 E.	23 2 3	1 20.0 E.	3 42.7
40	25 19.5	2 9.2 E.	24 50.5	2 47.6	24 21.5	3 25.9	3 45.3
45	26 33.9	4 12.3	26 4.3	4 48.5	25 34.6	5 24.7	3 47.8
50	27 43 0	6 9.8	27 12.7	6 44.1	26 42.5	7 18.4	3 50.2
55	28 47.3	8 2.8	28 16.5	8 35.3	27 45.6	9 7.7	3 52.5
21 0	+29 47 4	9 52.5	+29 16.0	10 23.2	+28 44.6	10 53.9	3 54.8
5	30 43.6	11 39.7	30 11.7	12 8.7	29 39.7	12 37.7	3 57.0
10	31 36.1	13 25.1	31 3.7	13 52.4	30 31.2	14 19.8	3 59.0
15	32 25.2	15 9.3	31 52.2	15 35.0	31 19.2	16 0.7	4 1.0
20	33 10.9	16 52.7	32 37.4	17 16.7	32 3.9	17 40.8	4 2.8
25	33 53.3	18 35.7	33 19.3	18 58 0	32 45.3	19 20.4	4 4.5
30	+34 32.6	20 18.7	+33 58.1	20 39.4	+33 23.6	21 0.0	4 6.0
35	35 8.8	22 2.3	34 33.8	22 21.2	33 58.8	22 40.1	4 7.4
40	35 41.8	23 46.5	35 6.4	24 3.6	34 30.9	24 20.8	4 8.6
45	36 11.8	25 31.5	35 35.9	25 46.8	35 0.0	26 2.1	4 9.6
50	36 38.8	27 17.6	36 2.4	27 30.9	35 26.1	27 44.3	4 10.4
55	37 2.6	29 5.0	36 25.8	29 16.3	35 49.1	29 27.7	4 11.0
22 0	+37 23.3	30 53.8	+36 46.1	31 3.1	+36 9.0	31 12.4	4 11.4
5	37 40.7	32 44.4	37 3.2	32 51.6	36 25.7	32 58.7	4 11.6
10	37 54.9	34 36.8	37 17.1	34 41.8	36 39.2	34 46.8	4 11.6
15	38 5.8	36 31.2	37 27.6	36 33.9	36 49.5	36 36.6	4 11.3
20	38 13.2	38 27.8	37 34.8	38 28.1	36 56.4	38 28.5	4 10.8
25	38 17.1	40 26.7	37 38.5	40 24.7	36 59.8	40 22.7	4 10.1
30	+38 17.2	42 28.3	+37 38.5	42 23.8	+36 59.7	42 19.3	4 9.2
35	38 13.5	44 32.8	37 34.6	44 25.7	36 55.7	44 18.6	4 8.0
40	38 5.8	46 40.5	37 26.9	46 30.7	36 47.9	46 20.8	4 6.6
45	37 53.7	48 51.6	37 14.8	48 39.0	36 35.8	48 26.4	4 5.0
50	37 37.1	51 6 8	36 58.3	50 51.3	36 19.4	50 35.8	4 3.1
55	37 15.9	53 26 6	36 37.2	53 8.1	35 58.5	52 49.6	4 1.2
23 0	+36 49.5	55 51.5	+36 11.0	55 29.9	+35 32.5	55 8.2	3 59.0
5	36 17.2	58 22.4	35 39.0	57 57.4	35 0.9	57 32.4	3 56.7
10	35 38.5	61 0.5	35 0.8	60 32.0	34 23.1	60 3.4	3 54.1
15	34 52.4	63 48.0	34 15.3	63 15.6	33 38.2	62 43.3	3 51.4
20	33 58.0	66 46.8	33 21.8	66 10.1	32 45.5	65 33.4	3 48.5
25	32 53.3	70 1.2	32 18.1	69 19.5	31 43.0	68 37.9	3 45.3
30	+31 35.3	73 36.9	+31 1.7	72 49.0	+30 28.2	72 1.1	3 41.9
35	29 59.1	77 44.8	29 28.0	76 48.6	28 56.9	75 52.4	3 38.3
40	27 54.2	82 47.6	27 27.5	81 38.4	27 0.8	80 29.2	3 34.1
45	24 46.7	90 1.3	24 32.1	88 20.8	24 17.5	86 40.4	3 29.0
Limits	+19 32.2	101 59.6 E.	+18 43.2	101 25.8 E.	+17 53.7	100 49.3 E.	

ANNULAR ECLIPSE



Note:- *The hours of beginning and ending are*

OF JUNE 16-17TH 1890.



are expressed in Greenwich Mean Time.

BESSELIAN ELEMENTS OF THE CENTRAL ECLIPSE OF THE SUN, 1890, DECEMBER 11.

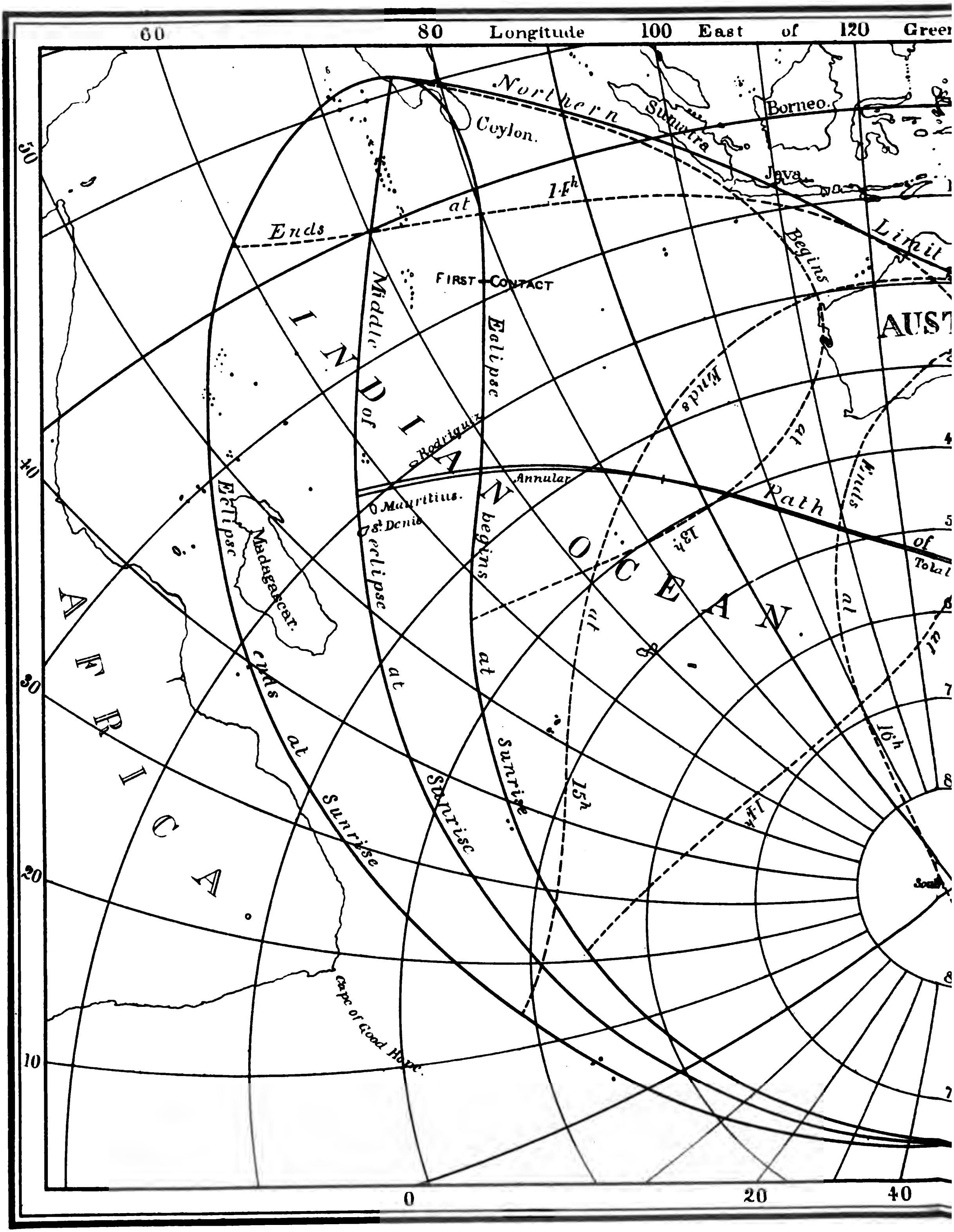
Greenwich Mean Time.	Co-ordinates of Centre of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra and Shadow on Fundamental Plane.	
	x	*y*	Log sin *d*	Log cos *d*	*μ*	*l*	*l′*
h m					° ′		
12 20	−1.60552	−0.22745	−9.59320	+9.96379	186 33.9	+0.54866	+0.00277
30	1.51379	0.24367	9.59321	9.96379	189 3.9	0.54865	0.00276
40	1.42205	0.25988	9.59322	9.96378	191 33.9	0.54864	0.00275
50	1.33031	0.27607	9.59322	9.96378	194 3.8	0.54863	0.00274
13 0	−1.23856	−0.29225	−9.59323	+9.96378	196 33.8	+0.54862	+0.00273
10	1.14681	0.30842	9.59324	9.96378	199 3.8	0.54861	0.00272
20	1.05505	0.32458	9.59325	9.96378	201 33.7	0.54860	0.00271
30	0.96329	0.34073	9.59326	9.96378	204 3.7	0.54859	0.00270
40	0.87152	0.35688	9.59327	9.96377	206 33.6	0.54858	0.00269
50	0.77974	0.37302	9.59328	9.96377	209 3.6	0.54857	0.00268
14 0	−0.68796	−0.38915	−9.59328	+9.96377	211 33.6	+0.54855	+0.00266
10	0.59617	0.40526	9.59329	9.96377	214 3.5	0.54853	0.00265
20	0.50438	0.42136	9.59330	9.96377	216 33.5	0.54852	0.00264
30	0.41259	0.43745	9.59331	9.96377	219 3.5	0.54850	0.00262
40	0.32079	0.45353	9.59332	9.96376	221 33.4	0.54848	0.00261
50	0.22899	0.46960	9.59333	9.96376	224 3.4	0.54847	0.00259
15 0	−0.13719	−0.48565	−9.59334	+9.96376	226 33.4	+0.54845	+0.00257
10	−0.04538	0.50169	9.59335	9.96376	229 3.3	0.54843	0.00255
20	+0.04643	0.51772	9.59336	9.96376	231 33.3	0.54841	0.00253
30	0.13824	0.53375	9.59336	9.96376	234 3.3	0.54839	0.00251
40	0.23005	0.54977	9.59337	9.96375	236 33.2	0.54837	0.00249
50	0.32186	0.56578	9.59338	9.96375	239 3.2	0.54835	0.00247
16 0	+0.41367	−0.58178	−9.59339	+9.96375	241 33.2	+0.54833	+0.00245
10	0.50549	0.59777	9.59340	9.96375	244 3.1	0.54831	0.00243
20	0.59731	0.61374	9.59341	9.96375	246 33.1	0.54829	0.00241
30	0.68913	0.62970	9.59342	9.96375	249 3.1	0.54827	0.00238
40	0.78095	0.64565	9.59343	9.96375	251 33.0	0.54824	0.00236
50	0.87277	0.66159	9.59343	9.96374	254 3.0	0.54822	0.00233
17 0	+0.96460	−0.67752	−9.59344	+9.96374	256 33.0	+0.54819	+0.00230
10	1.05642	0.69343	9.59345	9.96374	259 2.9	0.54817	0.00228
20	1.14824	0.70933	9.59346	9.96374	261 32.9	0.54814	0.00226
30	1.24006	0.72522	9.59347	9.96374	264 2.9	0.54811	0.00223
40	1.33188	0.74110	9.59348	9.96374	266 32.8	0.54808	0.00220
50	+1.42369	−0.75697	−9.59349	+9.96373	269 2.8	+0.54805	+0.00217

Greenwich Mean Time.	Log Δ *x* for 1 Minute.	Log Δ *y* for 1 Minute.	Log Δ *μ* for 1 Minute.	Log Tangents of Angles of Cones—	
				Penumbra.	Shadow.
h m					
12 0	+7.9625	−7.2107	+1.1760	+7.67672	+7.67461
13 0	7.9626	7.2090	1.1760	7.67672	7.67461
14 0	7.9628	7.2073	1.1760	7.67672	7.67461
15 0	7.9629	7.2056	1.1760	7.67673	7.67461
16 0	7.9629	7.2039	1.1760	7.67673	7.67462
17 0	7.9629	7.2020	1.1760	7.67673	7.67462
18 0	+7.9629	−7.2000	+1.1760	+7.67673	+7.67462

PATH OF THE ANNULUS AND SHADOW DURING THE CENTRAL ECLIPSE OF THE SUN, 1890, DECEMBER 11.

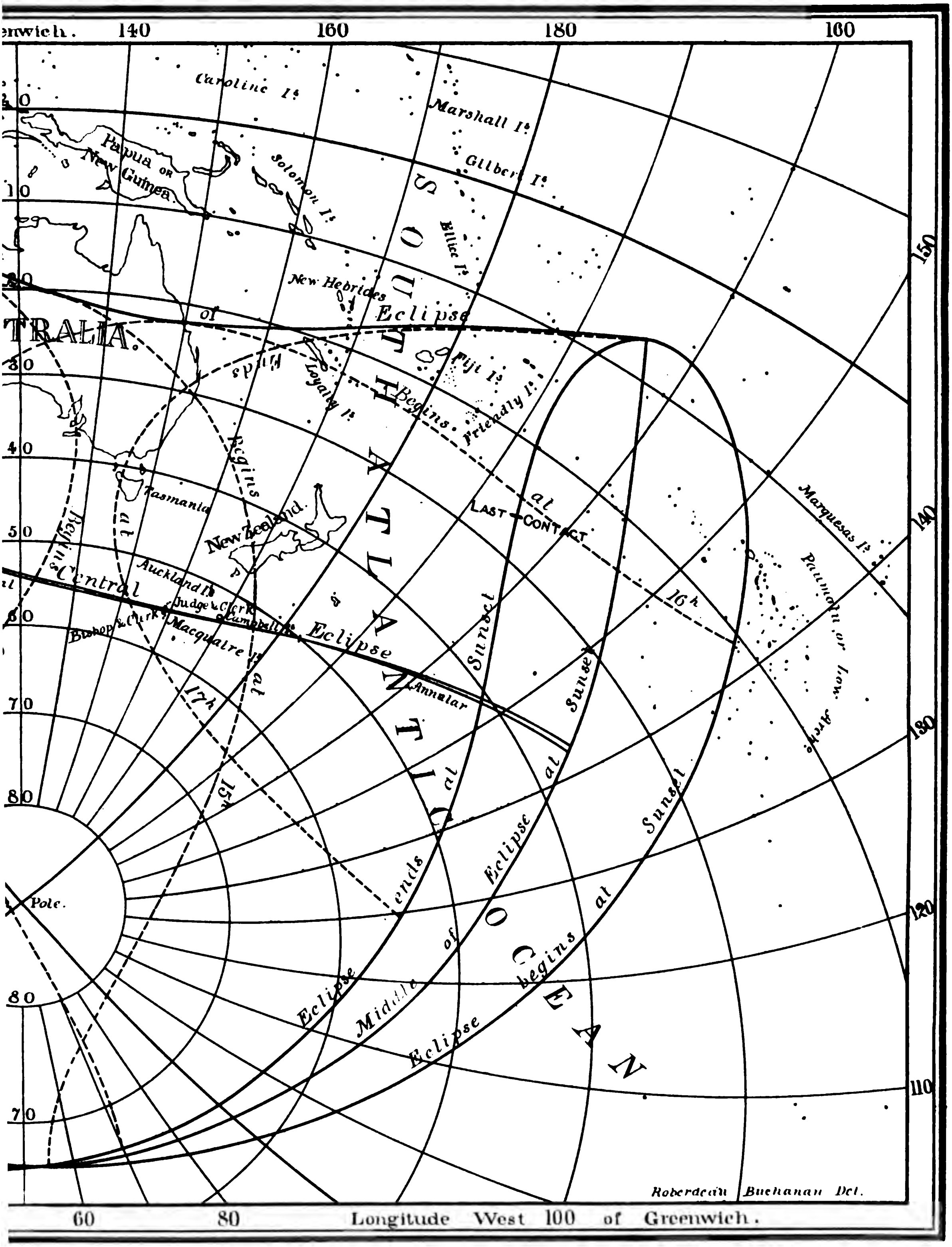
Greenwich Mean Time.	Northern Limit of Annulus and Southern Limit of Umbral Path.		Central Line.		Southern Limit of Annulus and Northern Limit of Umbral Path.		Duration of Annulus or Totality on Central Line.
	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	
	° ′	° ′	° ′	° ′	° ′	° ′	m s
Limits	−18 26.6	57 8.9 E.	−18 37.0	57 0.1 E.	−18 46.2	56 53.2 E.	
13h 35m	23 21.7	67 23.0	23 24.7	66 59.7	23 27.7	66 36.4	0 22.5
40	27 30.7	74 28.4	27 31.2	74 19.2	27 31.7	74 10.1	0 14.7
45	30 25.4	79 10.6	30 26.2	79 6.0	30 26.9	79 1.5	0 9.1
50	32 51.2	82 56.6	32 51.7	82 54.7	32 52.1	82 52.9	0 4.3
55	34 59.4	86 12.5	34 59.4	86 12.4	34 59.5	86 12.4	0 0.2
14 0	−36 55.4	89 10.0	−36 54.9	89 11.2	−36 54.4	89 12.5	0 3.5
5	38 42.0	91 55.0	38 41.0	91 57.3	38 40.0	91 59.7	0 6.9
10	40 21.1	94 32.9	40 19.6	94 36.0	40 18.1	94 39.2	0 9.9
15	41 53.5	97 5.4	41 51.5	97 9.2	41 49.5	97 13.0	0 12.7
20	43 20.3	99 35.3	43 17.8	99 39.5	43 15.3	99 43.8	0 15.2
25	44 41.9	102 4.1	44 38.9	102 8.7	44 35.9	102 13.4	0 17.5
30	−45 58.7	104 33.3	−45 55.2	104 38.2	−45 51.8	104 43.1	0 19.5
35	47 10.8	107 4.1	47 7.0	107 9.1	47 3.1	107 14.1	0 21.3
40	48 18.6	109 37.5	48 14.3	109 42.5	48 10.0	109 47.5	0 22.8
45	49 22.0	112 14.5	49 17.3	112 19.4	49 12.7	112 24.3	0 24.1
50	50 20.9	114 55.6	50 15.9	115 0.3	50 10.9	115 5.0	0 25.2
55	51 15.2	117 41.4	51 10.0	117 45.8	51 4.7	117 50.2	0 26.0
15 0	−52 4.9	120 32.5	−51 59.4	120 36.4	−51 53.9	120 40.4	0 26.6
5	52 50.0	123 29.4	52 44.2	123 32.8	52 38.5	123 36.2	0 27.0
10	53 30.0	126 32.5	53 24.1	126 35.3	53 18.3	126 38.1	0 27.1
15	54 4.9	129 42.6	53 58.9	129 44.7	53 53.0	129 46.8	0 26.9
20	54 34.2	132 59.7	54 28.2	133 1.0	54 22 3	138 2.4	0 26.5
25	54 57.7	136 23.8	54 51.8	136 24.4	54 45.9	136 24.9	0 25.8
30	−55 14.9	139 55.2	−55 9.2	139 54.9	−55 3.5	139 54.6	0 24.9
35	55 25.5	143 33.6	55 20.1	143 32.5	55 14.6	143 31.4	0 23.7
40	55 29 1	147 19.1	55 23.9	147 17.3	55 18.7	147 15.4	0 22.3
45	55 25.2	151 11.6	55 20.4	151 9.2	55 15.5	151 6.7	0 20.6
50	55 13.0	155 11.1	55 8.7	155 8.1	55 4.4	155 5.1	0 18.6
55	54 51.8	159 17.8	54 48.1	159 14.5	54 44.3	159 11.1	0 16.3
16 0	−54 21.1	163 32.1	−54 18.0	163 28.7	−54 14.9	163 25.2	0 13.8
5	53 40.2	167 55.3	53 37.8	167 52.0	53 35.4	167 48.7	0 11.0
10	52 47.6	172 28.3	52 46.0	172 25.5	52 44.4	172 22.7	0 7.9
15	51 40.7	177 14.6E.	51 39.8	177 12.8 E.	51 39.0	177 11.0 E.	0 4.4
20	50 16.7	177 40.1 W.	50 16.6	177 40.3 W.	50 16.6	177 40.5 W.	0 0.4
25	48 30.5	172 6.1	48 31.1	172 3.8	48 31.7	172 1.5	0 4.1
30	−46 10.0	165 39.6	−46 10.9	165 33.0	−46 11.8	165 26.3	0 9.4
35	42 39.4	157 8.9	42 40.3	156 50.9	42 41.2	156 33.0	0 16.6
Limits	−36 16.0	142 57.6 W.	−36 26.3	142 45.6 W.	−36 32.4	142 40.7 W.	

CENTRAL ECLIPSE O



Note:-*The hours of beginning and ending*

OF DECEMBER 11TH 1890.



g are expressed in Greenwich Mean Time.

WASHINGTON MEAN TIME.

PHASES OF THE MOON.

New Moon.				First Quarter.				Full Moon.				Last Quarter.			
	d	h	m		d	h	m		d	h	m		d	h	m
								January	5	12	28.6	January	13	13	24.5
January	20	6	40.8	January	27	3	8.2	February	4	8	5.3	February	12	1	43.2
February	18	17	19.5	February	25	20	58.2	March	6	1	39.2	March	13	10	56.5
March	20	3	53.2	March	27	16	24.4	April	4	16	16.3	April	11	17	45.0
April	18	14	57.4	April	26	11	43.3	May	4	4	0.7	May	10	23	13.4
May	18	3	10.3	May	26	5	25.7	June	2	13	26.0	June	9	4	41.7
June	16	16	49.5	June	24	20	45.4	July	1	21	15.0	July	8	11	34.9
July	16	7	41.3	July	24	9	35.8	July	31	4	16.3	August	6	21	10.5
August	14	23	11.4	August	22	20	11.5	August	29	11	26.8	September	5	10	21.2
September	13	14	44.8	September	21	4	57.2	September	27	19	51.5	October	5	3	15.1
October	13	5	56.8	October	20	12	28.3	October	27	6	33.7	November	3	23	4.8
November	11	20	29.4	November	18	19	36.4	November	25	20	14.6	December	3	20	18.4
December	11	10	2.7	December	18	3	28.1	December	25	12	48.8				

PERIGEE, APOGEE, AND GREATEST LIBRATION.

Apogee.			Perigee.			Greatest Libration.									
	d	h		d	h		d	h	m			d	h	m	
January	5	18.9	January	19	21.6	January	13	18	28	E.	January	25	19	11	W.
February	1	21.1	February	17	8.5	February	10	18	59	E.	February	23	3	21	W.
March	1	10.5	March	17	9.8	March	9	20	23	E.	March	23	4	24	W.
March	29	4.6	April	13	0.0	April	5	1	15	E.	April	19	16	33	W.
April	26	0.9	May	8	5.3	May	2	3	33	E.	May	16	7	3	W.
May	23	19.1	June	4	17.0	May	29	21	53	E.	June	11	17	50	W.
June	20	10.3	July	2	21.3	June	26	23	55	E.	July	9	7	14	W.
July	17	20.7	July	31	6.3	July	25	4	54	E.	August	6	8	53	W.
August	13	23.2	August	28	16.3	August	22	8	44	E.	September	3	14	0	W.
September	10	6.2	September	25	22.7	September	19	1	53	E.	October	1	17	50	W.
October	7	20.9	October	23	16.9	October	15	15	48	E.	October	29	14	45	W.
November	4	16.1	November	18	0.9	November	11	2	0	E.	November	25	19	8	W.
December	2	13.3	December	14	7.5	December	8	13	9	E.	December	22	0	0	W.
December	30	8.9													

FORMULÆ FOR THE LIBRATION OF THE MOON.

Put I, the inclination of the moon's equator to the ecliptic ($= 1° 28'.8$),

☊, the mean longitude of the moon's ascending node, (see page 278), or the mean longitude of the descending node of the moon's equator,

C, the angle at the centre of the moon's disk made by a lunar meridian with the circle of declination, counted from north to east on the apparent disk,

λ, β, α', δ', the apparent longitude, latitude, right ascension, and declination of the moon, corrected for parallax,

λ', the selenocentric longitude of the earth, counted on the moon's equator from its descending node, ☊,

i, Δ, ☊$'$, ☾, the quantities defined on page 276, where their values for the year are given.

The moon's libration in longitude and latitude may then be found, for any time, by means of the following formulæ, in connection with the tables given on pages 276 and 277:—

$$\left.\begin{aligned} \Delta\,\lambda &= -\,0'.57 \sin 2\,(\text{☊} - \lambda) \\ a &= \sin I \cos\,(\text{☊} - \lambda) \\ \tan B &= \tan I \sin\,(\text{☊} - \lambda) \\ \lambda' &= \lambda + \Delta\,\lambda + a\,b \end{aligned}\right\} \textit{See table, page 277.}$$

$$\text{The libration in latitude} \;= b = B - \beta$$

$$\text{The libration in longitude} = l = \lambda' - \text{☾}$$

$$\sin C = \sin i \,\frac{\cos\,(\lambda' + \Delta - \text{☊})}{\cos \delta'} = -\sin i\,\frac{\cos\,(\alpha' - \text{☊})}{\cos b}$$

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0. Δα	Red'ns from 1890.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	"	° '	d h m	h m				°	°
B. A. C. 1119	6	-0.15	-3.0	+16 10.7	1 5 34.3	- 3 12.8	-0.4135	0.5276	+0.1707	+17	-57
B. A. C. 1206	6	0.10	1.8	16 59.9	12 21.9	+ 3 22.2	-0.1810	0.5295	0.1622	+29	-41
B. A. C. 1240	6	0.07	1.4	17 53.0	16 7.2	+ 7 0.5	-0.5558	0.5303	0.1566	+ 9	-64
B. A. C. 1272	6	-0.04	1.6	17 2.7	19 40.2	+10 26.7	+0.9122	0.5322	0.1514	+90	+20
NEPTUNE				18 57.5	19 42.1	+10 28.7	-1.1850	0.5327	0.1517	-36	-71
ε Tauri	3½	+0.03	-1.3	+18 56.2	2 5 41.3	- 3 50.8	+0.2715	0.5351	+0.1358	+56	-14
W. iv, 650	6	0.06	0.9	20 27.8	10 19.9	+ 0 38.7	-0.7978	0.5366	0.1287	- 6	-70
ι Tauri	5	0.13	0.9	21 25.9	22 13.2	-11 50.5	-0.4623	0.5399	0.1079	+14	-52
l Tauri	5½	0.16	1.0	20 16.4	3 0 29.9	- 9 38.2	+1.0590	0.5407	0.1035	+90	+37
105 Tauri	6	0.15	0.8	21 33.6	0 31.2	- 9 36.9	-0.3610	0.5407	0.1035	+19	-45
108 Tauri	6½	+0.17	-0.8	+22 9.6	4 5.4	- 6 9.7	-0.6755	0.5423	+0.0975	+ 2	-65
n Tauri	5½	0.18	0.8	21 59.0	5 54.0	- 4 24.7	-0.2989	0.5428	0.0939	+23	-40
o Tauri	6	0.20	0.8	21 50.5	9 51.3	- 0 35.0	+0.2159	0.5436	0.0863	+53	-11
B. A. C. 1801	6	0.23	0.8	23 9.2	17 12.5	+ 6 31.9	-0.6563	0.5458	0.0724	+ 2	-63
141 Tauri	6½	0.24	0.9	22 23.9	4 1 49.4	- 9 8.4	+0.7319	0.5466	0.0553	+90	+20
1 Geminorum	5	+0.25	-0.9	+23 16.1	2 56.2	- 8 3.7	-0.1738	0.5467	+0.0529	+30	-29
2 Geminorum	7	0.29	0.7	23 38.8	4 10.9	- 6 51.5	-0.5268	0.5470	0.0503	+10	-51
3 Geminorum	6½	0.30	0.6	23 7.8	5 33.4	- 5 31.7	+0.1148	0.5479	0.0478	+46	-13
6 Geminorum	6½	0.30	0.9	22 55.9	6 46.0	- 4 21.6	+0.3907	0.5482	0.0451	+65	+ 2
η Geminorum	3½	0.29	1.0	22 32.3	7 58.3	- 3 11.6	+0.8778	0.5483	0.0430	+90	+30
9 Geminorum	6½	+0.30	-0.9	+23 46.7	8 54.0	- 2 17.8	-0.4593	0.5484	+0.0410	+14	-45
μ Geminorum	3	0.29	1.0	22 34.2	11 43.4	+ 0 26.0	+0.9891	0.5484	+0.0352	+90	+38
ω Geminorum	5½	0.29	1.2	24 22.2	5 6 0.1	- 5 53.7	-0.7131	0.5487	-0.0028	- 2	-64
44 Geminorum	6	0.36	1.4	22 48.1	7 22.8	- 4 33.7	+1.0240	0.5484	0.0055	+90	+44
48 Geminorum	6	0.34	1.4	24 18.8	10 39.5	- 1 23.6	-0.6871	0.5480	0.0122	0	-62
58 Geminorum	6½	+0.35	-1.6	+23 9.3	15 48.9	+ 3 35.5	+0.5112	0.5478	-0.0231	+75	+11
82 Geminorum	6½	0.35	1.8	23 24.7	6 3 30.9	- 9 5.6	-0.1852	0.5464	0.0470	+29	-29
84 Geminorum	6½	0.34	1.9	22 36.9	5 37.2	- 7 3.5	+0.5964	0.5460	0.0511	+83	+12
7 Cancri	6½	0.30	1.8	22 22.7	10 42.8	- 2 7.8	+0.5723	0.5453	0.0613	+81	+10
μ^1 Cancri	6½	0.33	1.7	22 57.0	11 51.5	- 1 1.5	-0.1352	0.5450	0.0638	+32	-28
μ^2 Cancri	5½	+0.32	-1.7	+21 54.1	12 33.9	- 0 20.5	+0.9833	0.5449	-0.0648	+90	+35
γ Cancri	4½	0.28	2.0	21 51.9	7 5 26.7	- 8 0.5	-0.3463	0.5408	0.0972	+20	-44
B. A. C. 3206	6½	0.19	2.2	20 15.8	8 1 24.3	+11 18.7	-0.8525	0.5336	0.1314	- 9	-70
η Leonis	3½	0.04	1.7	17 17.9	22 45.1	+ 8 0.3	-0.7206	0.5264	0.1626	0	-73
42 Leonis	6	+0.01	1.9	15 31.8	9 6 6.5	- 8 51.6	-0.0037	0.5244	0.1722	+39	-33
i Leonis	5½	-0.02	-1.4	+14 42.0	11 23.0	- 3 44.7	-0.0164	0.5226	-0.1784	+39	-34
ι Leonis *mult.*	4	0.04	-0.7	11 8.1	10 14 5.4	- 1 49.8	-1.2480	0.5158	0.2040	-39	-79
ω Virginis	6	0.06	0.0	8 44.6	21 41.4	+ 5 32.8	-0.2228	0.5154	0.2109	+28	-50
ξ Virginis	5½	0.32	0.0	8 52.2	11 1 15.0	+ 9 0.2	-1.1130	0.5151	0.2131	-25	-81
ν Virginis	4	0.33	+0.5	7 8.8	1 33.5	+ 9 18.3	+0.6907	0.5148	0.2134	+89	- 1
π Virginis	4½	-0.41	+0.7	+ 7 13.6	9 24.2	- 7 4.8	-1.0880	0.5146	-0.2180	-23	-83
11 Virginis	6	0.46	0.9	6 25.2	14 12.8	- 2 24.7	-1.2700	0.5150	0.2206	-39	-84
c Virginis	5½	0.50	1.7	3 55.6	19 35.5	+ 2 48.5	+0.2261	0.5157	0.2231	+53	-27
B. A. C. 4254	6	0.60	1.9	+ 2 27.8	12 4 56.7	+11 53.3	-0.3072	0.5165	0.2263	+23	-57
80 Virginis	6	0.91	4.0	- 4 50.0	13 10 3.4	- 7 52.2	+0.8084	0.5258	0.2278	+85	+ 4
88 Virginis	6½	-0.98	+4.4	- 6 17.2	16 23.6	- 1 43.7	+0.8950	0.5287	-0.2258	+84	+ 9
94 Virginis	6½	1.07	4.8	8 21.9	14 1 10.4	+ 6 46.5	+1.0950	0.5341	0.2230	+82	+24
ξ^1 Libræ	6	1.37	5.0	11 26.9	23 47.2	+ 4 39.2	-0.5903	0.5483	0.2065	+ 5	-79
o^1 Libræ	6½	1.51	5.6	15 8.9	15 11 41.3	- 7 51.3	+0.8095	0.5593	0.1941	+75	+ 5
o^2 Libræ	6½	1.53	5.2	14 44.4	12 34.8	- 6 59.6	+0.2211	0.5605	0.1929	+46	-27
ζ^3 Libræ	6	-1.59	+4.8	-16 13.7	15 54.0	- 3 47.5	+1.1020	0.5628	-0.1884	+74	+26
ζ^4 Libræ	5½	1.68	4.5	16 28.6	16 52.5	- 2 51.0	+1.1710	0.5640	0.1872	+74	+32
γ Libræ	4½	1.60	4.8	14 25.2	18 1.9	- 1 44.1	-1.1360	0.5655	0.1856	-39	-90
η Libræ	6	1.66	4.8	15 19.1	21 41.8	+ 1 47.8	-0.8919	0.5683	0.1803	-17	-90
θ Libræ	4½	1.73	4.9	16 24.3	16 1 48.9	+ 5 45.9	-0.5184	0.5712	0.1736	+ 4	-73
49 Libræ	6	-1.75	+4.2	-16 12.4	4 35.1	+ 8 26.0	-1.1930	0.5741	-0.1694	-42	-90
ν^2 Scorpii	4½	-1.80	+4.9	-19 10.4	9 20.9	-10 58.8	+1.0100	0.5785	-0.1613	+71	+20

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
ψ Ophiuchi	4½	-1.87	+ 4.6	-19 46.7	**16** 14 17.4	- 6 13.6	+0.8395	0.5831	-0.1522	+70	+ 8
χ Ophiuchi	4½	1.87	4.1	18 12.3	15 30.0	- 5 3.7	-0.9196	0.5853	0.1496	-23	-90
ξ Ophiuchi	5	2.11	2.4	20 59.5	**17** 12 36.7	- 8 47.3	-0.8116	0.6032	0.1016	-21	-90
58 Ophiuchi	4½	2.20	1.4	21 37.8	21 5.1	- 0 40.0	-0.9504	0.6098	0.0805	-32	-90
4 Sagittarii	5½	2.26	1.0	23 48.3	**18** 3 7.6	+ 5 7.2	+0.7601	0.6130	0.0636	+66	+ 4
7 Sagittarii	6	-2.28	+ 0.9	-24 16.8	4 14.8	+ 6 11.6	+1.1600	0.6139	-0.0604	+66	+37
P. xvii, 330	5½	2.26	0.7	23 8.4	4 33.4	+ 6 29.5	+0.0198	0.6141	0.0593	+21	-38
9 Sagittarii	6	2.28	0.9	24 21.8	4 37.5	+ 6 33.4	+1.2200	0.6141	0.0593	+66	+45
P. xvii, 334	5½	2.26	0.6	22 50.5	4 40.3	+ 6 36.0	-0.2824	0.6141	0.0592	+ 6	-57
B. A. C. 6161	5½	2.39	+ 0.3	23 43.5	7 31.4	+ 9 19.8	+0.4311	0.6152	-0.0512	+44	-15
VENUS				-22 5.9	**19** 18 32.6	- 5 9.9	-1.1290	0.5708	+0.0465	-48	-90
				NEW	*MOON.*						
φ Capricorni	5½	-2.24	- 9.6	21 6.6	**21** 2 42.8	+ 1 38.3	+1.0720	0.6032	0.1397	+69	+26
ε Capricorni	4½	2.17	10.5	19 57.7	11 18.2	+ 9 53.2	+1.2340	0.5968	0.1588	+70	+42
κ Capricorni	5	-2.15	-10.8	-19 22.2	13 29.5	+11 59.3	+1.0030	0.5943	+0.1631	+71	+19
29 Aquarii *mult.*	6½	2.06	11.3	17 29.8	21 23.0	- 4 25.9	+0 5082	0.5878	0.1782	+61	-12
50 Aquarii	6	1.96	11.4	14 5.4	**22** 6 23.0	+ 4 13.4	-1.1900	0.5807	0.1934	-39	-90
56 Aquarii	6½	1.84	11.7	15 9.0	8 47.6	+ 6 32.6	+0.3328	0.5793	0.1968	+52	-22
τ^2 Aquarii	4	1.83	11.8	14 10.6	16 55.4	- 9 37.6	+1.0130	0.5718	0.2077	+76	+21
74 Aquarii	6	-1.83	-11.8	-12 12.3	18 35.4	- 8 1.3	-0.6088	0.5701	+0.2096	+ 3	-81
ψ^1 Aquarii	4	1.72	11.7	9 41.4	**23** 4 17.8	+ 1 20.3	-1.0450	0.5619	0.2195	-23	-90
ψ^2 Aquarii	4	1.71	11.7	9 47.2	5 11.9	+ 2 12.5	-0.7521	0.5622	0.2205	- 5	-90
ψ^3 Aquarii	4½	1.71	11.8	10 12.9	5 39.8	+ 2 39.5	-0.2178	0.5618	0.2208	+25	-52
B. A. C. 8274	7	1.56	11.3	6 59.7	18 56.7	- 8 31.2	-0.4713	0.5527	0.2298	+13	-69
30 Piscium	4½	-1.51	-11.7	- 6 37.8	**24** 1 6.4	- 2 33.8	+0.5797	0.5473	+0.2324	+75	- 9
33 Piscium	5	1.51	11.6	6 19.6	2 40.6	- 1 2.8	+0.6383	0.5464	0.2331	+80	- 6
B. A. C. 17	6	1.46	11.4	5 51.2	4 59.5	+ 1 11.5	+0.6971	0.5453	0.2338	+84	- 2
15 Ceti	6½	1.32	9.9	1 6.8	18 6.9	-10 6.8	-1.0790	0.5374	0.2356	-22	-90
20 Ceti	5	1.26	10.4	- 1 44.7	**25** 1 18.3	- 3 9.0	+1.2680	0.5341	0.2352	+88	+39
26 Ceti	6	-1.20	- 9.2	+ 0 46.4	6 32.6	+ 1 55.3	-0.1109	0.5327	+0.2345	+34	-45
29 Ceti	6½	1.18	9.1	1 24.9	8 34.7	+ 3 53.6	-0.3033	0.5313	0.2337	+23	-57
33 Ceti	6	1.17	8.8	1 51.5	9 50.4	+ 5 6.9	-0.4687	0.5313	0.2335	+15	-68
35 Ceti	6½	1.15	9.0	1 53.2	10 48.3	+ 6 3.0	-0.2743	0.5305	0.2331	+25	-56
f Piscium	5	1.13	8.5	3 2.0	13 23.4	+ 8 33.3	-0.8678	0.5297	0.2322	- 8	-87
ν Piscium	4½	-1.02	- 8.0	+ 4 55.7	**26** 1 3.7	- 4 8.1	-0.1755	0.5274	+0.2272	+30	-48
64 Ceti	5½	0.85	6.5	8 3.2	15 58.2	+10 19.1	-0.1646	0.5246	0 2172	+31	-47
ξ^1 Ceti	4½	0.84	6.3	8 19.7	16 47.1	+11 6.4	-0.2796	0.5243	0.2165	+25	-53
ξ Arietis	5½	0.78	5.5	10 6.6	22 40.7	- 7 10.7	-0.9147	0.5240	0.2117	-11	-80
B. A. C. 755	6½	0.77	5.4	10 4.0	23 39.2	- 6 14.1	-0.6637	0.5247	0.2110	+ 4	-78
B. A. C. 830	6	-0.71	- 5.3	+10 16.2	**27** 7 31.8	+ 1 24.2	+0.7518	0.5247	+0.2036	+90	+ 5
38 Arietis	5	0.69	4.6	11 58.9	8 44.3	+ 2 34.4	-0.8373	0.5248	0.2026	- 7	-78
Lalande 5725	6	0.58	4.1	12 45.9	19 26.9	-11 2.6	+0.4280	0.5254	0.1908	+66	-12
B. A. C. 1119	6	0.42	2.6	16 10.7	**28** 11 47.7	+ 4 48.1	-0.3061	0.5280	0.1706	+23	-50
B. A. C. 1206	6	0.34	2.3	16 59.9	18 32.6	+11 20.4	-0.0818	0.5298	0.1610	+35	-35
B. A. C. 1240	6	-0.30	- 1.8	+17 53.0	22 16.9	- 9 2.3	-0.4536	0.5307	+0.1563	+15	-57
NEPTUNE				18 54.4	**29** 1 4.4	- 6 20.0	-1.1440	0.5308	0.1518	-31	-71
B. A. C. 1272	6	0.28	1.9	17 2.7	1 48.9	- 5 36.9	+1.0040	0.5308	0.1505	+90	+27
ε Tauri	3½	0.18	1.4	18 56.2	11 48.4	+ 4 3.7	+0.3638	0.5338	0.1349	+62	- 9
W. iv., 650	6	0.13	0.8	20 27.2	16 26.5	+ 8 33.0	-0.6942	0.5351	0.1274	0	-85
ι Tauri	5	-0.02	- 0.5	+21 25.9	**30** 4 19.9	- 3 56.4	-0.3806	0.5382	+0.1072	+18	-46
l Tauri	5½	0.00	0.8	20 16.4	6 36.7	- 1 44.0	+1.1360	0.5388	0.1026	+90	+44
105 Tauri	6	+ 0.01	0.5	21 33.6	6 38.1	- 1 42.6	-0.2813	0.5388	0.1026	+24	-40
108 Tauri	6½	0.03	0.2	22 9.6	10 12.5	+ 1 44.9	-0.5893	0.5403	0.0965	+ 6	-60
n Tauri	5½	0.05	0.3	21 59.0	12 1.3	+ 3 30.1	-0.2210	0.5404	0.0929	+27	-36
o Tauri	6	+0.10	- 0.3	+21 50.5	15 59.1	+ 7 20.2	+0.2878	0.5420	+0.0857	+57	- 8
B. A. C. 1801	6	+0.17	- 0.2	+23 9.2	23 21.4	- 9 31.8	-0.5868	0.5432	+0.0721	+ 6	-57

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
141 Tauri	6½	+0.25	-0.4	+22 23.9	31 7 59.7	- 1 10.5	+0.7912	0.5450	+0.0544	+90	+23
1 Geminorum	5	0.26	0.2	23 16.1	9 6.6	- 0 5.8	-0.1147	0.5450	0.0521	+33	-26
2 Geminorum	7	0.26	0.2	23 38.8	10 21.5	+ 1 6.6	-0.4714	0.5454	0.0493	+13	-46
3 Geminorum	6½	0.28	0.2	23 7.8	11 44.1	+ 2 26.4	+0.1683	0.5451	0 0466	+50	-10
6 Geminorum	6½	0.28	0.4	22 55.9	12 56.9	+ 3 36.9	+0.4437	0.5453	0.0439	+69	+ 5
η Geminorum	3½	+0.29	-0.5	+22 32.3	14 9.3	+ 4 46.9	+0.9317	0.5455	+0.0420	+90	+33
9 Geminorum	6½	0.30	0.2	23 46.7	15 6.4	+ 5 42.1	-0.4049	0.5458	0.0403	+17	-41
μ Geminorum	3	+0.33	-0.5	+22 34.2	17 55.2	+ 8 25.3	+1.0410	0.5466	+0.0341	+90	+41

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ω Geminorum	5½	+0.46	-0.6	+24 22.2	1 12 14.6	+ 2 8.4	-0.6816	0.5474	-0.0037	0	-60
44 Geminorum	6	0.47	0.9	22 48.1	13 37.5	+ 3 28.6	+1.0555	0.5474	0.0066	+90	+45
48 Geminorum	6	0.49	0.5	24 18.8	16 54.6	+ 6 39.0	-0.6575	0.5473	0.0133	+ 2	-59
58 Geminorum	6½	0.52	1.1	23 9.3	22 4.4	+11 38.5	+0.5315	0.5473	0.0237	+77	+11
82 Geminorum	6½	+0.59	-1.3	+23 24.7	2 9 47.0	- 1 2.0	-0.1760	0 5464	-0.0481	+30	-28
84 Geminorum	6½	0.59	1.6	22 36.9	11 53.2	+ 1 0.0	+0.6019	0.5463	0.0524	+84	+12
7 Cancri	6½	0.61	1.7	22 22.7	16 58.5	+ 5 55.3	+0.5723	0.5455	0.0626	+81	+10
μ¹ Cancri	6½	0.61	1.5	22 57.0	18 7.4	+ 7 1.9	-0.1371	0.5455	0.0648	+32	-28
μ² Cancri	5½	0.61	1.7	21 54.1	18 49.7	+ 7 42.9	+0.9815	0.5454	0.0663	+90	+35
η Cancri	5½	+0.63	-2.0	+20 48.9	3 6 39.0	- 4 50.9	+1.2665	0.5425	-0.0891	+90	+61
γ Cancri	4½	0.64	2.5	21 51.9	11 40.5	+ 0 0.8	-0.3697	0.5414	0.0984	+19	-45
B. A. C. 3206	6½	0.58	2.5	20 15.8	4 7 43.2	- 4 34.9	-0.9208	0.5352	0.1329	-14	-70
η Leonis	3½	0.62	3.6	17 17.9	5 4 47.9	- 8 9.4	-0.7982	0.5284	0.1648	- 5	-73
42 Leonis	6	0.59	3.6	15 31.8	12 6.5	- 1 4.2	-0.0916	0.5268	0.1742	+35	-38
l Leonis	5½	+0.56	-3.6	+14 42.0	17 21.3	+ 4 1.0	-0.1099	0.5258	-0.1806	+34	-39
ω Virginis	6	0.41	3.6	8 44.6	7 3 30.4	-10 50.8	-0.3623	0.5170	0.2125	+20	-59
ξ Virginis	5½	0.38	3.8	8 52.2	7 3.5	- 7 23.9	-1.2610	0.5170	0.2154	-39	-81
ν Virginis	4	0.38	4.4	7 8.8	7 22.0	- 7 5.9	+0.5453	0.5169	0.2154	+75	-10
π Virginis	4½	0.33	3.3	7 13.6	15 12.2	+ 0 30.6	-1.2440	0.5160	0.2197	-37	-83
c Virginis	5½	+0.27	-2.9	+ 3 55.5	8 1 23.9	+10 24.3	+0.0631	0.5160	-0.2247	+43	-36
B. A. C. 4254	6	+0.19	2.7	+ 2 27.7	10 47.1	- 4 28.9	-0.4785	0.5160	0.2269	+14	-69
80 Virginis	6	-0.08	1.1	- 4 50.1	9 16 9.6	+ 0 1.4	+0.6241	0.5230	0.2272	+80	- 7
88 Virginis	6½	0.14	-0.5	6 17.3	22 35.5	+ 6 15.6	+0.7120	0.5255	0.2251	+84	- 2
ξ¹ Libræ	6	0.46	+0.2	11 27.0	11 6 40.1	-10 40.4	-0.7947	0.5423	0.2040	- 8	-90
o¹ Libræ	6½	-0.62	+1.4	-15 9.0	18 54.7	+ 1 9.7	+0.6302	0.5505	-0.1906	+72	- 5
o² Libræ	6½	0.68	1.0	14 44.5	19 49.9	+ 2 3.1	+0.0345	0.5518	0.1897	+35	-38
ζ¹ Libræ	6	0.68	1.5	16 19.9	22 10.0	+ 4 18.3	+1.2380	0.5529	0.1865	+74	+40
ζ³ Libræ	6	0.70	2.0	16 13.8	23 15.2	+ 5 21.3	+0.9309	0.5545	0.1854	+74	+13
ζ⁴ Libræ	5½	0.67	1.4	16 28.7	12 0 15.6	+ 6 19.7	+1.0035	0.5552	0.1842	+74	+18
η Libræ	6	-0.73	+0.8	-15 19.2	5 14.5	+11 8.2	-1.0925	0.5589	-0.1770	-31	-90
θ Libræ	4½	0.79	1.1	16 24.4	9 29.8	- 8 45.5	-0.7117	0.5626	0.1706	- 7	-90
ν² Scorpii	4½	0.91	1.7	19 10.5	17 17.5	- 1 14.5	+0.8480	0.5681	0.1575	+71	+ 8
ψ Ophiuchi	4½	0.99	1.6	19 46.8	22 24.3	+ 3 41.0	+0.6813	0.5733	0.1488	+69	- 2
χ Ophiuchi	4½	1.00	1.0	18 12.4	23 39.6	+ 4 53.7	-1.1070	0.5740	0.1462	-36	-90
ξ Ophiuchi	5	-1.29	+1.4	-20 59.6	13 21 32.8	+ 1 56.7	-0.9714	0.5909	-0.0992	-32	-90
58 Ophiuchi	5½	1.38	0.1	21 37.8	14 6 19.9	+10 22.8	-1.1040	0.5978	0.0776	-44	-90
4 Sagittarii	5½	1.49	0.2	23 48.3	12 35.4	- 7 37.0	+0.6443	0.6015	0.0610	+60	- 3
7 Sagittarii	6	1.50	+0.2	24 16.8	13 44.9	- 6 30.3	+1.0520	0.6023	0.0581	+66	+26
P. xvii, 330	5½	1.50	-0.2	23 8.4	14 4.1	- 6 11.8	-0.1085	0.6026	0.0568	+14	-46
9 Sagittarii	6	-1.51	+0.2	-24 21.8	14 8.3	- 6 7.8	+1.1130	0.6027	-0.0564	+66	+32
P. xvii, 334	5½	1.50	-0.3	22 50.5	14 11.4	- 6 4.9	-0.4140	0.6027	0.0564	-25	-67
B. A. C. 6161	5½	1.54	0.4	23 43.5	17 8.5	- 3 15.0	+0.3150	0.6040	0.0488	+37	-22
24 Sagittarii	6	1.62	1.0	24 6.8	15 1 30.5	+ 4 46.1	+0.3903	0.6075	0.0252	+39	-17
25 Sagittarii	6½	1.62	1.0	24 18.3	1 45.1	+ 5 0.2	+0.5746	0.6075	0.0249	+53	- 7
B. A. C. 6343	6½	-1.63	-1.7	-23 35.9	3 15.2	+ 6 26.5	-0.1642	0.6074	-0.0207	+ 8	-50
26 Sagittarii	6½	-1.64	-1.3	-23 56.1	4 29.8	+ 7 37.9	+0.1476	0.6082	-0.0166	+24	-31

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	″	° ′	d h m	h m				°	°
ν^1 Sagittarii	5	-1.67	- 2.2	-22 52.7	**15** 9 7.1	-11 56.3	-0.9486	0.6098	-0.0033	-38	-90
ν^2 Sagittarii	5	1.69	2.2	22 48.5	9 28.1	-11 36.2	-1.0200	0.6102	0.0028	-43	-90
B. A. C. 6448	6½	1.70	2.2	23 18.8	9 47.8	-11 17.4	-0.5199	0.6102	-0.0018	-13	-76
χ^1 Sagittarii	5½	1.83	3.0	24 43.3	20 38.7	- 0 53.9	+1.0280	0.6118	+0.0297	+65	+24
χ^2 Sagittarii	6½	1.83	3.1	24 37.6	20 41.1	- 0 51.6	+0.9354	0.6118	0.0298	+65	+17
χ^3 Sagittarii	5½	-1.83	- 3.1	-24 10.7	20 44.3	- 0 48.5	+0.4933	0.6118	+0.0300	+46	-12
53 Sagittarii	6½	1.84	3.9	23 40.6	**16** 2 3.7	+ 4 17.4	+0.1993	0.6121	0.0453	+29	-28
B. A. C. 6727	6	1.84	3.9	23 40.9	2 10.3	+ 4 23.7	+0.2076	0.6121	0.0458	+30	-28
4 Capricorni	6	1.92	5.6	22 9.0	16 18.6	- 6 3.8	-0.3706	0.6115	0.0860	+ 3	-63
				NEW	*MOON.*						
ψ^1 Aquarii	4	-1.77	-11.7	- 9 41.4	**19** 15 19.9	- 9 49.3	-0.9369	0.5681	+0.2238	-15	-90
ψ^2 Aquarii	4	1.77	11.7	9 47.2	16 13.2	- 8 58.0	-0.6423	0.5674	0.2245	+ 3	-84
ψ^3 Aquarii	4½	1.76	12.1	10 12.9	16 40.6	- 8 31.5	-0.1115	0.5667	0.2248	+31	-46
B. A. C. 8274	7	1.70	11.6	6 59.7	**20** 5 42.9	+ 4 3.3	-0.3383	0.5585	0.2345	+20	-59
30 Piscium	4½	-1.66	-11.9	- 6 37.8	11 45.0	+ 9 53.0	+0.7209	0.5552	+0.2375	+83	- 1
33 Piscium	5	1.66	11.8	6 19.6	13 17.0	+11 21.8	+0.7780	0.5541	0.2379	+74	+ 2
B. A. C. 17	6	1.63	11.2	5 51.7	15 32.7	-10 27.1	+0.8500	0.5527	0.2389	+84	+ 7
14 Ceti	6	1.57	10.9	1 6.8	**21** 3 9.0	+ 0 45.9	-1.1765	0.5464	0.2409	-29	-90
15 Ceti	6½	1.56	10.9	- 1 6.8	4 20.1	+ 1 54.6	-0.8948	0.5464	0.2411	-10	-90
26 Ceti	6	-1.52	-10.4	+ 0 46.4	16 25.1	-10 24.2	+0.0838	0.5408	+0.2395	+44	-35
29 Ceti	6½	1.45	10.2	1 24.9	18 23.8	- 8 29.2	-0.1027	0.5405	0.2390	+34	-45
33 Ceti	6	1.44	9.9	1 51.5	19 37.2	- 7 18.2	-0.2654	0.5396	0.2385	+26	-55
35 Ceti	6½	1.44	10.1	1 53.2	20 33.5	- 6 23.8	-0.0702	0.5388	0.2380	+36	-44
f Piscium	5	1.43	9.6	3 1.9	23 4.0	- 3 58.1	-0.6536	0.5380	0.2370	+ 5	-84
ν Piscium	4½	-1.32	- 9.3	+ 4 55.6	**22** 10 23.6	+ 6 59.8	+0.0450	0.5360	+0.2318	+42	-36
64 Ceti	5½	1.24	7.9	8 3.2	**23** 0 51.5	- 2 59.7	+0.0680	0.5328	0.2215	+44	-34
ξ^1 Ceti	4½	1.22	7.7	8 19.7	1 38.9	- 2 13.9	-0.0436	0.5322	0.2206	+38	-40
ξ Arietis	5½	1.18	6.9	10 6.6	7 22.3	+ 3 18.8	-0.6666	0.5322	0.2158	+ 4	-79
B. A. C. 755	6½	1.17	6.8	10 4.0	8 19.2	+ 4 13.8	-0.4175	0.5322	0.2150	+17	-61
B. A. C. 830	6	-1.20	- 6.6	+10 16.2	15 58.5	+11 38.7	+0.9842	0.5320	+0.2071	+90	+18
38 Arietis	5	1.09	6.0	11 58.9	17 8.9	-11 13.1	-0.5838	0.5319	0.2057	+ 8	-72
Lalande 5725	6	1.01	5.4	12 45.9	**24** 3 34.4	- 1 7.3	+0.6697	0.5323	0.1938	+88	+ 2
B. A. C. 1119	6	0.85	3.6	16 10.7	18 31.8	-10 40.1	-0.0573	0.5337	0.1724	+37	-35
B. A. C. 1206	6	0.79	3.2	16 59.9	**25** 2 8.0	- 3 16.5	+0.1654	0.5341	0.1626	+49	-22
B. A. C. 1240	6	-0.65	- 2.2	+17 53.0	5 47.8	+ 0 16.3	-0.2036	0.5348	+0.1569	+28	-41
B. A. C. 1272	6	0.70	2.8	17 2.7	8 15.9	+ 2 37.6	+1.0890	0.5356	0.1535	+90	+33
NEPTUNE				18 56.3	8 34.9	+ 2 58.0	-0.9151	0.5352	0.1526	-13	-71
ω^1 Tauri	6	0.71	1.9	19 19.0	9 46.7	+ 4 7.5	-1.1430	0.5356	0.1509	-31	-71
ϵ Tauri	3½	0.59	1.8	18 56.2	19 5.0	-10 52.0	+0.6008	0.5375	0.1356	+82	+ 4
W. iv, 650	6	-0.55	- 1.2	+20 27.8	23 38.9	- 6 27.0	-0.4601	0.5382	+0.1276	+14	-54
ι Tauri	5	0.42	0.7	21 25.9	**26** 11 23.0	+ 4 54.3	-0.1442	0.5399	0.1062	+31	-33
105 Tauri	6	0.39	0.5	21 33.6	13 39.7	+ 7 6.6	-0.0475	0.5408	0.1024	+37	-27
108 Tauri	6½	0.35	0.0	22 9.6	17 11.9	+10 31.9	-0.3547	0.5410	0.0956	+20	-44
κ Tauri	5½	0.33	0.1	21 59.0	18 59.7	-11 43.9	+0.0073	0.5420	0.0924	+40	-23
o Tauri	6	-0.27	- 0.1	+21 50.5	22 55.3	- 7 56.0	+0.5111	0.5421	+0.0845	+74	+ 5
B. A. C. 1801	6	0.21	+ 0.3	23 9.2	**27** 6 14.1	- 0 51.6	-0.3677	0.5441	0.0708	+19	-42
141 Tauri	6½	0.10	0.2	22 23.9	14 49.2	+ 7 26.5	+0.9984	0.5449	0.0531	+90	+37
1 Geminorum	5	0.09	0.4	23 16.1	15 55.9	+ 8 31.0	+0.0939	0.5450	0.0509	+45	-14
2 Geminorum	7	0.09	0.5	23 38.8	17 10.6	+ 9 43.2	-0.2615	0.5451	0.0484	+25	-33
3 Geminorum	6½	-0.06	+ 0.4	+23 7.8	18 32.8	+11 2.7	+0.3721	0.5449	+0.0456	+64	+ 1
5 Geminorum	6½	0.04	0.8	24 26.6	19 21.4	+11 49.7	-1.0420	0.5449	0.0442	-25	-66
6 Geminorum	6½	0.05	0.4	22 55.9	19 45.3	-11 47.1	+0.6465	0.5449	0.0433	+90	+16
η Geminorum	3½	0.04	0.2	22 32.3	20 57.6	-10 37.2	+1.1310	0.5449	0.0406	+90	+49
9 Geminorum	6½	-0.02	0.6	23 46.7	21 54.3	- 9 42.5	-0.2026	0.5449	0.0386	+28	-29
μ Geminorum	3	0.00	+ 0.3	+22 34.2	**28** 0 42.6	- 6 59.7	+1.2345	0.5455	+0.0328	+90	+60
ω Geminorum	5½	+0.21	+ 0.7	+24 22.2	18 59.9	+10 41.2	-0.5024	0.5459	-0.0052	+11	-45

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
44 Geminorum	6	+0.22	+ 0.3	+22 48.1	28 20 22.7	-11 58.8	+1.2260	0.5459	-0.0083	+90	+61
48 Geminorum	6	+0.26	+ 0.6	+24 18.8	23 39.8	- 8 48.3	-0.4881	0.5455	-0.0151	+12	-45
MARCH.											
58 Geminorum	6½	+0.31	+0.2	+23 9.3	1 4 49.5	- 3 48.8	+0.6913	0.5451	-0.0255	+90	+20
82 Geminorum	6½	0.43	+0.1	23 24.7	16 32.6	+ 7 31.1	-0.0333	0.5445	0.0500	+38	-21
84 Geminorum	6½	0.45	-0.2	22 36.9	18 38.8	+ 9 53.2	+0.7432	0.5444	0.0540	+90	+20
7 Cancri	6½	0.49	0.5	22 22.7	23 44.4	- 9 31.2	+0.7025	0.5439	0.0641	+90	+17
μ^1 Cancri	6½	0.50	0.2	22 57.0	2 0 53.3	- 8 24.6	-0.0055	0.5437	0.0663	+39	-22
μ^2 Cancri	5½	+0.48	-0.5	+21 54.1	1 35.6	- 7 43.7	+1.1109	0.5435	-0.0677	+90	+44
γ Cancri	4½	0.60	1.0	21 51.9	18 27.0	+ 8 34.9	-0.2675	0.5403	0.1004	+25	-39
B. A. C. 3206	6½	0.59	1.9	20 15.8	3 14 29.2	+ 3 58.7	-0.8604	0.5348	0.1355	- 9	-70
η Leonis	3½	0.81	3.3	17 17.9	4 11 30.1	+ 0 20.3	-0.7821	0.5299	0.1674	- 4	-73
42 Leonis	6	0.82	3.8	15 31.8	18 46.7	+ 7 23.5	-0.0931	0.5274	0.1767	+35	-38
i Leonis	5½	+0.82	-4.0	+14 41.9	23 59.6	-11 33.1	-0.1204	0.5268	-0.1837	+33	-40
ω Virginis	6	0.80	5.0	8 44.5	6 9 52.2	- 2 41.5	-0.4512	0.5201	0.2163	+16	-65
ν Virginis	4	0.79	5.2	7 8.7	13 41.5	+ 1 1.1	+0.4449	0.5198	0.2187	+67	-15
c Virginis	5½	0.80	5.3	3 55.5	7 7 31.8	- 5 40.3	-0.0770	0.5195	0.2281	+36	-44
B. A. C. 4254	6	0.71	5.4	+ 2 27.7	16 48.8	+ 3 20.2	-0.6357	0.5199	0.2308	+ 6	-82
80 Virginis	6	+0.56	-4.6	- 4 50.1	8 21 53.6	+ 7 32.8	+0.4081	0.5258	-0.2298	+64	-18
88 Virginis	6½	0.54	4.4	6 17.3	9 4 16.6	-10 15.9	+0.4850	0.5278	0.2278	+69	-14
B. A. C. 4647	6½	0.52	4.2	7 31.0	7 35.3	- 7 3.3	+1.0300	0.5293	0.2263	+82	+18
94 Virginis	6½	0.44	4.1	8 22.0	13 9.3	- 1 39.7	+0.6748	0.5310	0.2234	+81	- 4
95 Virginis	6	0.48	3.8	8 47.3	13 21.8	- 1 27.6	+1.0720	0.5313	0.2234	+81	+21
ξ^1 Libræ	6	+0.30	-3.3	-11 27.0	10 12 14.2	- 3 18.9	-1.0555	0.5413	-0.2054	-24	-90
o^1 Libræ	6½	0.23	2.2	15 9.0	11 0 30.9	+ 8 33.3	+0.3680	0.5507	0.1913	+54	-20
o^2 Libræ	6½	0.19	2.4	14 44.5	1 26.2	+ 9 26.8	-0.2326	0.5513	0.1901	+22	-53
ζ^1 Libræ	6	0.18	1.6	16 19.9	3 47.2	+11 43.0	+0.9757	0.5522	0.1870	+74	+16
ζ^3 Libræ	6	0.17	1.5	16 13.8	4 52.7	-11 13.8	+0.6661	0.5524	0.1854	+72	- 4
ζ^4 Libræ	5½	+0.14	-1.9	-16 28.7	5 53 5	-10 15.0	+0.7370	0.5531	-0.1839	+73	+ 1
θ Libræ	4½	+0.04	2.0	16 24.4	15 12.3	- 1 15.6	-0.9861	0.5589	0.1702	-24	-90
ν^2 Scorpii	4½	-0.02	1.1	19 10.5	23 5.4	+ 6 20.8	+0.5851	0.5648	0.1571	+64	- 8
MARS				20 1.8	12 1 30.6	+ 8 40.8	+1.0960	0.5530	0.1496	+70	+27
ψ Ophiuchi	4½	0.10	1.1	19 46.8	4 16.8	+11 21.0	+0.4168	0.5675	0.1475	+52	-17
4 Sagittarii	5½	-0.62	-0.5	-23 48.3	13 19 17.4	+ 0 52.6	+0.4068	0.5928	-0.0598	+43	-17
7 Sagittarii	6	0.64	0.5	24 16.8	20 29.0	+ 2 1.4	+0.8208	0.5928	0.0563	+66	+ 8
P. xvii, 330	5½	0.64	0.9	23 8.4	20 48.6	+ 2 20.2	-0.3554	0.5928	0.0555	+ 2	-62
9 Sagittarii	6	0.64	0.5	24 21.8	20 53.0	+ 2 24.4	+0.8816	0.5928	0.0554	+66	+12
P. xvii, 334	5½	0.64	1.0	22 50.5	20 56.1	+ 2 27.3	-0.6666	0.5928	0.0551	-16	-90
B. A. C. 6161	5½	-0.69	-0.8	-23 43.5	23 58.3	+ 5 22.4	+0.0762	0.5944	-0.0470	+23	-35
24 Sagittarii	6	0.78	1.0	24 6.8	14 8 35.4	-10 21.3	+0.1619	0.5970	0.0236	+25	-30
25 Sagittarii	6½	0.79	0.9	24 18.3	8 50.5	-10 6.8	+0.3490	0.5971	0.0233	+36	-20
B. A. C. 6343	6½	0.80	1.3	23 35.9	10 23.3	- 8 37.7	-0.3980	0.5976	0.0186	- 5	-66
26 Sagittarii	6½	0.82	1.2	23 56.1	11 40.2	- 7 23.9	-0.0791	0.5976	0.0151	+12	-45
B. A. C. 6369	6	-0.85	-0.8	-25 7.2	12 47.9	- 6 19.0	+1.1030	0.5978	-0.0125	+65	+31
ν^1 Sagittarii	5	0.87	1.7	22 52.7	16 26.5	- 2 49.2	-1.1900	0.5994	0.0020	-58	-90
B. A. C. 6448	6½	0.90	1.7	23 18.8	17 8.5	- 2 9.0	-0.7508	0.5997	-0.0003	-26	-90
χ^1 Sagittarii	5½	1.04	1.8	24 43.3	15 4 21.1	+ 8 36.2	+0.8389	0.6008	+0.0302	+65	+ 9
χ^2 Sagittarii	6½	1.04	1.9	24 37.6	4 23.6	+ 8 38.6	+0.7433	0.6008	0.0314	+65	+ 3
χ^3 Sagittarii	5½	-1.03	-2.0	-24 10.7	4 26.9	+ 8 41.8	+0.2937	0.6008	+0.0314	+34	-23
h^1 Sagittarii	6	1.09	2.0	24 57.6	8 28 4	-11 26.5	+1.2260	0.6008	0.0424	+65	+46
53 Sagittarii	6½	1.11	1.7	23 40.7	9 57.2	-10 1.4	+0.0050	0.6011	0.0462	+19	-40
B. A. C. 6727	6	1.11	1.7	23 40.9	10 4.0	- 9 54.8	+0.0134	0.6011	0.0462	+20	-40
4 Capricorni	6	1.23	3.7	22 9.0	16 0 41.3	+ 4 6.8	-0.6343	0.5983	0.0834	-12	-88
17 Capricorni	6	-1.35	-4.7	-21 54.9	11 38.7	- 9 22.2	+0.3150	0.5951	+0.1142	+42	-22
η Capricorni	5	-1.41	-5.6	-20 17.5	18 51.0	- 2 27.1	-0.4217	0.5926	+0.1317	+ 5	-67

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0. Δα	Red'ns from 1890.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
		s	′	° ′	d h m	h m				°	°
χ Capricorni	5½	-1.43	-5.5	-21 38.2	**16** 20 28.4	- 0 53.6	+1.1400	0.5902	+0.1357	+68	+32
27 Capricorni	6½	1.42	5.6	20 59.9	20 52.2	- 0 30.7	+0.5550	0.5916	0.1367	+60	- 9
φ Capricorni	5½	1.45	5.7	21 6.6	23 17.5	+ 1 48.9	+1.0030	0.5910	0.1417	+69	+20
ε Capricorni	4½	1.48	6.5	19 57.6	**17** 7 55.0	+10 6.3	+1.1580	0.5860	0.1604	+70	+33
κ Capricorni	5	1.49	6.7	19 22.2	10 10.6	-11 43.3	+0.9385	0.5848	0.1647	+71	+14
29 Aquarii *mult.*	6½	-1.53	-7.6	-17 29.8	18 17.6	- 3 54.9	+0.4717	0.5813	+0.1808	+59	-14
50 Aquarii	6	1.43	8.6	14 5.4	**18** 3 29.3	+ 4 56.1	-1.2000	0.5757	0.1963	-39	-90
τ² Aquarii	4	1.59	9.1	-14 10.6	14 9.9	- 8 46.7	+1.0650	0.5695	0.2117	+76	+55
				NEW	*MOON.*						
f Piscium	5	-1.56	-9.6	+ 3 1.9	**21** 9 24.6	+ 8 10.7	-0.2803	0.5415	+0.2405	+25	-56
ν Piscium	4½	1.53	9.4	4 55.7	20 36.4	- 4 59.3	+0.2238	0.5408	0.2359	+53	-27
64 Ceti	5½	1.49	8.4	8 3.2	**22** 10 50.8	+ 8 47.7	+0.2796	0.5390	0.2260	+56	-23
ξ¹ Ceti	4½	1.48	8.3	8 19.7	11 37.4	+ 9 32.7	+0.1684	0.5387	0.2252	+50	-29
ξ Arietis	5½	1.46	7.6	10 6.6	17 14.7	- 9 0.7	-0.4372	0.5385	0.2202	+17	-63
B. A. C. 755	6½	-1.46	-7.3	+10 4.0	18 10.4	- 8 6.9	-0.1899	0.5382	+0.2192	+30	-47
31 Arietis	5½	1.44	7.0	11 58.2	22 50.6	- 3 35.7	-1.1710	0.5382	0.2145	-30	-78
B. A. C. 830	6	1.43	7.3	10 16.2	**23** 1 40.6	- 0 51.2	+1.2145	0.5378	0.2110	+90	+37
38 Arietis	5	1.43	6.9	11 58.9	2 49.5	+ 0 15.5	-0.3398	0.5383	0.2100	+22	-56
Lalande 5725	6	1.36	6.2	12 45.9	13 1.9	+10 8.2	+0.9156	0.5387	0.1976	+90	+16
B. A. C. 1119	6	-1.27	-4.5	+16 10.6	**24** 4 38.2	+ 1 14.3	+0.2186	0.5403	+0.1759	+53	-21
B. A. C. 1206	6	1.21	4.0	16 59.8	11 5.9	+ 7 29.3	+0.4474	0.5407	0.1658	+68	- 8
B. A. C. 1240	6	1.19	3.4	17 52.9	14 40.5	+10 56.9	+0.0822	0.5410	0.1599	+45	-25
NEPTUNE				19 3.1	18 15.3	- 9 35.3	-0.6110	0.5413	0.1540	+ 6	-66
ω¹ Tauri	6	1.16	2.8	19 19.0	18 34.4	- 9 16.9	-0.8476	0.5423	0.1536	- 8	-71
ε Tauri	3½	-1.07	-2.6	+18 56.2	**25** 3 40.8	- 0 28.4	+0.8884	0.5429	+0.1376	+90	+21
W. iv, 650	6	1.04	1.9	20 27.8	8 9.2	+ 3 51.2	-0.1622	0.5433	0.1297	+31	-36
ι Tauri	5	0.91	1.1	21 25.9	19 39.9	- 9 0.9	+0.1540	0.5451	0.1078	+49	-17
105 Tauri	6	0.89	0.9	21 33.6	21 53.7	- 6 51.6	+0.2504	0.5459	0.1035	+55	-11
108 Tauri	6½	0.85	0.4	22 9.6	**26** 1 22.1	- 3 30.1	-0.0563	0.5459	0.0962	+37	-26
n Tauri	5½	-0.83	-0.4	+21 59.0	3 8.1	- 1 47.7	+0.3055	0.5459	+0.0933	+59	- 7
o Tauri	6	0.78	0.4	21 50.5	6 59.7	+ 1 56.2	+0.8037	0.5459	0.0854	+90	+21
B. A. C. 1801	6	0.70	-0.3	23 9.2	14 11.8	+ 8 53.9	-0.0675	0.5469	0.0711	+36	-25
1 Geminorum	5	0.58	+0.4	23 16.1	23 45.6	- 5 51.5	+0.3901	0.5474	0.0509	+65	+ 2
2 Geminorum	7	0.60	0.8	23 38.8	**27** 0 59.3	- 4 40.3	+0.0348	0.5474	0.0482	+42	-17
3 Geminorum	6½	-0.57	+0.7	+23 7.8	2 20.6	- 3 21.8	+0.6668	0.5474	+0.0458	+90	+17
5 Geminorum	6½	0.55	1.2	24 26.7	3 8.6	- 2 35.4	-0.7437	0.5474	0.0458	- 3	-66
6 Geminorum	6½	0.55	1.1	22 55.9	3 32.3	- 2 12.5	+0.9361	0.5474	0.0430	+90	+33
9 Geminorum	6½	0.53	0.9	23 46.7	5 39.7	- 0 9.4	+0.0936	0.5478	0.0385	+46	-13
ε Geminorum	3½	0.37	1.7	25 14.4	18 1.7	+11 47.8	-1.2060	0.5468	+0.0121	-44	-65
ω Geminorum	5½	-0.26	+2 3	+24 22.2	**28** 2 34.3	- 3 56.7	-0.2192	0.5464	-0.0061	+27	-27
48 Geminorum	6	0.20	1.8	24 18.8	7 12.7	+ 0 32.3	-0.2026	0.5457	0.0156	+28	-27
52 Geminorum	6½	0.18	2.1	25 4.5	8 14.2	+ 1 31.8	-1.0670	0.5457	0.0177	-27	-65
58 Geminorum	6½	0.13	1.4	23 9.3	12 21.0	+ 5 30.4	+0.9670	0.5457	0.0262	+90	+37
κ Geminor. *mult.*	3½	-0.01	2.0	24 39.7	22 5.1	- 9 4.8	-1.0590	0.5438	0.0466	-26	-65
82 Geminorum	6½	+0.01	+1.6	+23 24.7	**29** 0 2.0	- 7 11.8	+0.2307	0 5435	-0.0506	+54	- 8
84 Geminorum	6½	0.03	1.3	22 36.9	2 8.2	- 5 9.8	+1.0020	0.5428	0.0547	+90	+37
7 Cancri	6½	0.10	1.2	22 22.7	7 13.5	- 0 14.4	+0.9576	0.5421	0.0648	+90	+33
μ¹ Cancri	6½	0.11	1.3	22 57.0	8 22.2	+ 0 52.0	+0.2491	0.5420	0.0670	+55	- 8
γ Cancri	4½	0.30	+0.8	21 51.9	**30** 1 56.9	- 6 7.5	-0.0332	0.5373	0.1012	+38	-26
B. A. C. 3206	6½	+0.51	-0.2	+20 15.8	22 2.0	-10 40.8	-0.6600	0.5327	-0.1365	+ 3	-68
η Leonis	3½	+0.68	-1.7	+17 17.9	**31** 19 6.3	+ 9 44.2	-0.6162	0.5272	-0.1687	+ 6	-69

APRIL.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
42 Leonis	6	+0.71	-2.2	+15 31.8	**1** 2 23.7	- 7 11.8	+0.0565	0.5250	-0.1785	+43	-30
i Leonis	5½	+0.73	-2.5	+14 41.9	7 37.1	- 2 7.9	+0.0163	0.5250	-0.1853	+41	-33

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's					At Conjunction in R. A.					Limiting Parallels	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
ω Virginis	6	+0.88	-4.8	+ 8 44.5	2 17 26.7	+ 6 40.8	-0.3939	0.5206	-0.2191	+20	-61
ν Virginis	4	0.90	5.1	7 8.7	21 15.0	+10 22.3	+0.4883	0.5204	0.2215	+70	-13
c Virginis	5½	0.95	6.0	3 55.4	3 14 57.9	+ 3 33.5	-0.0766	0.5214	0.2317	+36	-44
B. A. C. 4254	6	0.95	5 9	+ 2 27.6	4 0 9.4	-11 31.5	-0.6572	0.5228	0.2346	+ 5	-84
65 Virginis	6	0.96	6.2	- 4 21.0	22 47.8	+10 25.8	+1.2200	0.5277	0.2355	+86	+33
66 Virginis	6	+0.96	-6.2	4 35.4	23 23.9	+11 0.8	+1.3320	0.5280	-0.2355	+85	+47
80 Virginis	6	0.95	6.2	4 50.2	5 4 51.0	- 7 42.2	+0.3070	0.5303	0.2344	+57	-24
88 Virginis	6½	0 95	6.2	6 17.4	11 7.8	- 1 37.2	+0.3671	0.5320	0.2322	+61	-21
B. A. C 4647	6½	0.95	6.0	7 31.1	14 23.0	+ 1 32.0	+0.9036	0.5343	0.2310	+82	+ 9
94 Virginis	6½	0.93	5.9	8 22.1	19 51.5	+ 6 50.1	+0.5357	0.5358	0.2282	+71	-12
95 Virginis	6	+0.93	-5.8	- 8 47.4	20 3.5	+ 7 1.7	+0.9303	0.5358	-0.2277	+81	+11
κ Virginis	4½	0.92	5.8	9 45.8	23 1.0	+ 9 53.6	+1.2750	0.5378	0.2261	+80	+40
o^1 Libræ	6½	0.83	4.5	15 9.1	7 6 35.1	- 7 35.0	+0.1621	0.5560	0.1950	+42	-31
o^2 Libræ	6½	0.82	4.7	14 44.6	7 29.5	- 6 42.5	-0.4337	0.5558	0.1933	+11	-67
ζ^3 Libræ	6	0 80	3.8	16 13.8	10 52.5	- 3 26.5	+0.4543	0.5580	0.1890	+59	-16
ζ^4 Libræ	5½	+0.79	-4.2	-16 28.7	11 52.3	- 2 28.8	+0.5214	0.5590	-0.1876	+63	-12
θ Libræ	4½	0.73	4.0	16 24.4	21 1.9	+ 6 21.4	-1.2040	0.5640	0.1732	-42	-90
β^1 Scorpii	2	0.73	3.2	19 30.2	8 1 59.5	+11 8.5	+1.1420	0.5671	0.1644	+70	+30
β^2 Scorpii	5½	0 73	3.2	19 30.0	1 59.6	+11 8.6	+1.1390	0.5671	0.1644	+70	+30
ν^2 Scorpii	4½	0.70	3.2	19 10.5	4 48.1	-10 9.1	+0.3425	0.5693	0.1596	+48	-21
ψ Ophiuchi	4½	+0.65	-2.9	-19 46.8	9 55.2	- 5 13.3	+0.1795	0.5722	-0.1499	+38	-30
ω Ophiuchi	4½	0.63	2.5	21 13 8	13 15.8	- 2 0.0	+1.1760	0.5746	0.1435	+69	+35
Mars				21 46.7	20 22.7	+ 4 51.0	+0.7720	0.5745	0.1264	+68	+ 4
c^2 Ophiuchi	5	0.40	1.2	23 52.6	9 13 24.4	- 2 46.5	+1.0590	0.5880	0.0881	+66	+26
4 Sagittarii	5½	0.27	0.8	23 48.3	10 0 39.4	+ 8 1.9	+0.1475	0.5915	0.0596	+28	-31
7 Sagittarii	6	+0.27	-0.7	-24 16.8	1 51.0	+ 9 10.7	+0.5627	0.5921	-0.0568	+53	- 8
P. xvii, 330	5½	0.26	1.0	23 8.4	2 10.8	+ 9 29.8	-0.6170	0.5921	0.0560	-13	-86
9 Sagittarii	6	0.27	0.6	24 21.8	2 15.0	+ 9 33.8	+0.6237	0.5921	0.0555	+58	- 5
P. xvii, 334	5½	0.26	0.6	22 50.5	2 18.2	+ 9 36.8	-0.9253	0.5921	0.0555	-32	-90
B. A. C. 6161	5½	0.22	0.8	23 43.5	5 20.7	-11 27.9	-0.1847	0.5932	0.0474	+ 9	-51
24 Sagittarii	6	+0.09	-0.8	-24 6.8	13 59.3	- 3 10.1	-0.0964	0.5951	-0.0237	+11	-46
25 Sagittarii	6½	0.09	0.8	24 18.3	14 14.5	- 2 55.4	+0.0914	0.5951	0.0232	+22	-35
B. A. C. 6343	6½	0.07	0.7	23 35.9	15 47.8	- 1 25.9	-0.6600	0.5993	0.0192	-19	-90
26 Sagittarii	6½	0.05	0.5	23 56.1	17 5.3	- 0 11.6	-0.3401	0.5958	0.0156	- 3	-62
B. A. C. 6369	6	+0.03	1.1	25 7.2	18 13.2	+ 0 53.6	+0.8461	0.5961	-0.0127	+65	+10
B. A. C. 6448	6½	-0.03	-0.8	-23 18.8	22 35.8	+ 5 5.6	-1.0150	0.5967	0.0000	-43	-90
ψ Sagittarii	5½	0.11	0.3	25 26.7	11 6 7.8	-11 40.5	+1.2230	0.5961	+0.0203	+65	+46
χ^1 Sagittarii	5½	0.16	0.3	24 43.3	9 55.4	- 8 2.1	+0.5878	0.5961	0.0309	+53	- 7
χ^2 Sagittarii	6½	0.16	0.3	24 37.6	9 58.1	- 7 59.5	+0.4932	0.5960	0.0311	+46	-12
χ^3 Sagittarii	5½	0.17	0.4	24 10.7	10 1.4	- 7 56.3	+0.0405	0.5960	0.0311	+20	-38
h^1 Sagittarii	6	-0.22	-0.2	-24 57.6	14 6.1	- 4 1.4	+0.9831	0.5958	+0.0422	+65	+20
h^2 Sagittarii	4½	0.23	0.1	25 7.5	14 21.7	- 3 46.5	+1.1620	0.5958	0.0431	+65	+37
53 Sagittarii	6½	0.25	0.6	23 40.6	15 36.2	- 2 35.0	-0.2499	0.5955	0.0465	+ 6	-56
B. A. C. 6727	6	0.25	0.7	23 40.8	15 43.1	- 2 28.4	-0.2415	0 5955	0.0465	+ 6	-55
4 Capricorni	6	0.43	1.2	22 8.9	12 6 35.8	+11 48 7	-0.7992	0.5916	0.0864	-22	-90
17 Capricorni	6	-0.59	-1.7	-21 54.8	17 47.7	- 1 25.8	+0.0843	0.5875	+0.1139	+29	-35
η Capricorni	5	0.65	2.3	20 17.4	13 1 10.4	+ 5 39.8	-0.6526	0.5840	0.1309	- 9	-89
χ Capricorni	5½	0.68	2.0	21 38.2	2 50.0	+ 7 15.5	+0.9292	0.5830	0.1349	+68	+14
27 Capricorni	6½	0.68	2 2	20 59.9	3 14.7	+ 7 39.3	+0.3406	0.5826	0.1354	+46	-21
φ Capricorni	5½	0.71	2.2	21 6 6	5 43.8	+10 2.7	+0.7976	0.5818	0.1414	+69	+ 5
ε Capricorni	4½	-0.82	-2.8	-19 57.6	14 35.2	- 5 25.9	+0.9663	0.5769	+0.1580	+70	+16
κ Capricorni	5	0.85	3.0	19 22.1	16 54.7	- 3 11.7	+0.7454	0.5758	0.1641	+69	+ 1
29 Aquarii *mult.*	5	0.91	3.7	17 29.7	14 1 15.7	+ 4 50.8	+0.2833	0.5706	0.1791	+47	-24
56 Aquarii	6½	1.03	5.0	15 8.9	13 15.0	- 7 35.9	+0.1757	0.5644	0.1985	+43	-30
τ^1 Aquarii *mult.*	5½	1.10	5.3	14 38.2	20 52.9	- 0 14.3	+1.2170	0.5609	0.2094	+75	+35
τ^2 Aquarii	4	-1.11	-5.4	-14 10.5	21 43.1	+ 0 34.2	+0.9239	0.5605	+0.2102	+76	+12
74 Aquarii	6	-1.12	-5.8	-12 12 2	23 26.9	+ 2 14.3	-0.7107	0.5594	+0.2123	- 3	-90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination.	Washington Mean Time.	Hour Angle *H*	*Y*	*x'*	*y'*	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
ψ¹ Aquarii	4	-1.18	-6.6	- 9 41.3	**15** 9 27.8	+11 54.5	-1.0830	0.5545	+0.2238	-25	-90
ψ² Aquarii	4	1.18	6.6	9 47.1	10 23.5	-11 11.8	-0.7780	0.5540	0.2246	- 5	-90
ψ³ Aquarii	4½	1.19	6.7	10 12.8	10 52.0	-10 44.2	-0.2356	0.5540	0.2250	+25	-54
B. A. C. 8274	7	1.27	7.3	6 59.6	**16** 0 24.0	+ 2 20.3	-0.3929	0.5474	0.2353	+18	-63
30 Piscium	4½	1.31	7.4	6 37.7	6 37.2	+ 8 21.2	+0.7091	0.5457	0.2387	+83	- 3
33 Piscium	5	-1.31	-7.5	- 6 19.5	8 11.8	+ 9 52.6	+0.7767	0.5459	+0.2399	+75	+ 1
B. A. C. 17	6	1.33	7.6	5 51.6	10 31.3	-11 52.5	+0.8620	0.5449	0.2407	+84	+ 7
14 Ceti	6	1.40	8.2	- 1 6.7	22 23.4	- 0 23.7	-1.1210	0.5413	0.2440	-24	-90
				NEW	*MOON.*						
Lalande 5725	6	-1.49	-6.1	+12 45.9	**19** 22 21.8	- 2 43.7	+1.0570	0.5407	+0.2000	+90	+25
B. A. C. 1119	6	1.48	4.9	16 10.6	**20** 13 52.0	-11 44.0	+0.3866	0.5434	0.1781	+64	-12
B. A. C. 1206	6	1.44	4.4	16 59.8	20 16.1	- 5 32.5	+0.6263	0.5445	0.1687	+85	+ 2
B. A. C. 1240	6	1.44	3.9	17 52.9	23 48.8	- 2 6.9	+0.2674	0.5450	0.1626	+56	-17
ω¹ Tauri	6	1.44	3.5	19 18.9	**21** 3 39.9	+ 1 36.6	-0.6536	0.5460	0.1561	+ 4	-68
NEPTUNE				+19 13.2	4 50.8	+ 2 45.2	-0.3679	0.5444	+0.1538	+20	-50
ω² Tauri	5½	-1.42	-3.0	20 18.3	7 24.3	+ 5 13.6	-1.1440	0.5468	0.1494	-31	-70
ε Tauri	3½	1.37	3.0	18 56.1	12 40.1	+10 18.9	+1.0910	0.5471	0.1400	+90	+35
W. iv, 650	6	1.35	2.4	20 27.7	17 5.1	- 9 25.0	+0.0485	0.5478	0.1321	+43	-25
ι Tauri	5	1.27	1.5	21 25.8	**22** 4 26.3	+ 1 33.3	+0.3790	0.5483	0.1095	+64	- 6
105 Tauri	6	-1.26	-1.3	+21 33.6	6 38.6	+ 3 41.2	+0.4746	0.5495	+0.1052	+72	+ 1
108 Tauri	6½	1.23	0.9	22 9.6	10 4.2	+ 6 59.9	+0.1736	0.5502	0.0987	+51	-15
n Tauri	5½	1.22	0.8	21 59.0	11 48.7	+ 8 40.8	+0.5345	0.5509	0.0949	+77	+ 5
o Tauri	6	1.18	-0.7	21 50.5	15 37.3	-11 38.3	+1.0360	0.5504	0.0869	+90	+36
121 Tauri	6	1.17	+0.1	23 57.9	19 7.5	- 8 15.2	-0.9817	0.5509	0.0799	-19	-66
B. A. C. 1801	6	-1.12	+0.1	+23 9.2	22 43.4	- 4 46.7	+0.1764	0.5514	+0.0724	+51	-12
132 Tauri	5½	1.01	0.3	24 31.8	**23** 1 16.5	- 2 18.8	-1.1470	0.5514	0.0672	-35	-65
1 Geminorum	5	1.03	0.2	23 16.1	8 9.8	+ 4 20.5	+0.6387	0.5514	0.0523	+89	+15
2 Geminorum	7	1.03	0.6	23 38.8	9 22.6	+ 5 30.8	+0.2847	0.5512	0.0490	+58	- 5
3 Geminorum	6½	0.99	0.7	23 7.8	10 42.8	+ 6 48.2	+0.9143	0.5509	0.0466	+90	+32
5 Geminorum	6½	-0.99	+0.7	+24 26.6	11 30.4	+ 7 34.2	+0.4891	0.5509	+0.0442	+12	-48
6 Geminorum	6½	0.98	0.8	22 55.9	11 53.6	+ 7 56.6	+1.1840	0.5509	0.0438	+90	+53
9 Geminorum	6½	0.96	0.9	23 46.7	13 59.5	+ 9 58.3	+0.3455	0.5509	0.0392	+62	0
ε Geminorum	3½	0.84	1.9	25 14.4	**24** 2 13.2	- 2 12.9	-0.9415	0.5493	+0.0128	-17	-65
ω Geminorum	5½	0.72	2.5	24 22.2	10 40.9	+ 5 57.7	+0.0440	0.5480	-0.0055	+43	-13
48 Geminorum	6	-0.66	+2.4	+24 18.8	15 17.0	+10 24.4	+0.0570	0.5476	-0.0153	+43	-13
52 Geminorum	6½	0.66	2.6	25 4.5	16 17.9	+11 23.3	-0.7996	0.5476	0.0174	- 7	-65
A Geminorum	5½	0.61	2.8	25 15.6	20 20.4	- 8 42.3	-1.0940	0.5465	0.0257	-30	-65
58 Geminorum	6½	0.60	2.2	23 9.3	20 23.0	- 8 39.8	+1.2260	0.5463	0.0266	+90	+59
κ Geminor. *mult.*	3½	0.48	2.9	24 39.7	**25** 6 3.4	+ 0 41.2	-0.7902	0.5444	0.0466	- 6	-65
82 Geminorum	6½	-0.46	+2.5	+23 24.7	7 59.6	+ 2 33.8	+0.4955	0.5439	-0.0507	+74	+ 7
84 Geminorum	6½	0.42	2.3	22 36.9	10 5.4	+ 4 35.2	+1.2660	0.5432	0.0548	+90	+63
7 Cancri	6½	0.37	2.2	22 22.7	15 9.6	+ 9 29.4	+1.2230	0.5416	0.0650	+90	+56
μ¹ Cancri	6½	0.32	2.4	22 57.0	16 18.2	+10 35.7	+0.5139	0.5415	0.0672	+75	+ 7
γ Cancri	4½	-0.13	2.3	21 51.9	**26** 9 51.9	+ 3 35.2	+0.2266	0.5359	0.1015	+54	-13
B. A. C. 3206	6½	+0.11	+1.8	+20 15.8	**27** 6 0.7	- 0 54.4	-0.4081	0.5293	-0.1365	+18	-51
η Leonis	3½	0.34	+0.4	17 17.9	**28** 3 13.1	- 4 21.2	-0.3865	0.5237	0.1686	+19	-54
42 Leonis	6	0.42	-0.3	15 31.8	10 34.0	+ 2 45.3	+0.2797	0.5224	0.1786	+57	-19
i Leonis	5½	0.46	0.5	14 42.0	15 50.0	+ 7 52.8	+0.2299	0.5212	0.1853	+54	-22
ι Leonis *mult.*	4	0.70	2.3	11 8.0	**29** 18 24.5	+ 9 39.8	-1.1900	0.5170	0.2130	-31	-79
ω Virginis	6	+0.71	-3.1	+ 8 44.5	**30** 1 56.5	- 7 1.8	-0.2319	0.5166	-0.2191	+28	-52
ξ Virginis	5½	0.77	3.1	8 52.1	5 27.9	- 3 36.4	-1.1440	0.5166	0.2216	-26	-81
ν Virginis	4	0.77	3.6	7 8.7	5 46.2	- 3 18.7	+0.6463	0.5168	0.2219	+84	- 5
π Virginis	4½	0.83	4.8	7 13.5	13 31.6	+ 4 13.0	-1.1800	0.5176	0.2275	-29	-83
c Virginis	5½	+0.89	-4.8	+ 3 55.4	23 34.6	-10 2.0	+0.0445	0.5184	-0.2325	+13	-37

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
B. A. C. 4254	6	+0.95	-5.0	+ 2 27.6	1 8 47.7	- 1 5.4	-0.5533	0.5212	-0.2360	+11	-74
65 Virginis	6	1.08	6.2	- 4 21.0	2 7 23.9	- 3 10.2	+1.2660	0.5283	0.2380	+86	+37
κ Virginis	4½	1.19	6.4	9 45.8	3 7 25.3	- 3 54.3	+1.2650	0.5408	0.2294	+80	+38
o^1 Libræ	6½	1.17	5.6	15 9.1	4 14 28.9	+ 2 6.5	+0.0955	0.5614	0.1990	+39	-35
o^2 Libræ	6½	1.25	5.6	14 44.6	15 22.2	+ 2 57.9	-0.4999	0.5618	0.1978	+ 8	-72
ζ^1 Libræ	6	+1.26	-5.4	-16 20.0	17 37.9	+ 5 8.8	+0.6829	0.5631	-0.1945	+73	- 3
ζ^3 Libræ	6	1.26	5.1	16 13.9	18 41.1	+ 6 9.8	+0.3747	0.5641	0.1930	+54	-20
ζ^4 Libræ	5½	1.26	5.3	16 28.8	19 39.5	+ 7 6.2	+0.4412	0.5650	0.1918	+59	-16
β^1 Scorpii	2	1.27	4.4	19 30.3	5 9 27.8	- 3 35.6	+1.0300	0.5748	0.1683	+70	+21
β^2 Scorpii	5½	1.27	4.4	19 30.1	9 27.9	- 3 35.5	+1.0270	0.5748	0.1683	+70	+20
ν^2 Scorpii	4½	+1.26	-4.3	-19 10.6	12 12.4	- 0 57.1	+0.2402	0.5761	-0.1631	+43	-27
ψ Ophiuchi	4½	1.25	3.8	19 46.9	17 12.1	+ 3 51.3	+0.0626	0.5805	0.1537	+32	-37
ω Ophiuchi	4½	1.24	3.5	21 13.9	20 27.6	+ 6 59.4	+1.0440	0.5818	0.1467	+69	+22
b Ophiuchi *var.*	5	1.16	1.6	24 4.4	6 18 1.5	+ 3 42.8	+1.2770	0.5943	0.0961	+66	+56
c^2 Ophiuchi	5	1.14	1.4	23 52.6	19 59.9	+ 5 36.5	+0.8958	0.5953	0.0916	+66	+12
63 Ophiuchi	6½	+1.11	-0.6	-24 51.9	7 5 4.3	- 9 41.0	+1.1750	0.5997	-0.0669	+65	+38
4 Sagittarii	5½	1.08	0.7	23 48.3	6 58.3	- 7 51.7	-0.0168	0.5997	0.0615	+19	-41
7 Sagittarii	6	1.06	0.6	24 16.8	8 8.7	- 6 44.1	+0.3909	0.5997	0.0584	+42	-18
P. xvii, 330	5½	1.06	0.8	23 8.4	8 27.6	- 6 26.0	-0.7736	0.5999	0.0576	-22	-90
9 Sagittarii	6	1.07	0.5	24 21.8	8 31.7	- 6 22.0	+0.4530	0.5999	0.0572	+46	-15
P. xvii, 334	5½	+1.05	-0.9	-22 50.5	8 34.8	- 6 19.1	-1.0800	0.5999	-0.0572	-43	-90
B. A. C. 6161	5½	1.02	-0.5	23 43.5	11 32.9	- 3 28.2	-0.3507	0.6008	0.0490	0	-63
λ Sagittarii	3	0.97	+0.3	25 28.9	17 43.3	+ 2 27.0	+1.1710	0.6019	0.0315	+65	+37
24 Sagittarii	6	0.93	0.1	24 6.8	20 0.0	+ 4 38.0	-0.2718	0.6025	0.0252	+ 3	-57
25 Sagittarii	6½	0.93	0.2	24 18.3	20 14.9	+ 4 52.4	-0.0856	0.6025	0.0243	+12	-45
B. A. C. 6343	6½	+0.92	+0.2	-23 35.9	21 46.1	+ 6 19.8	-0.8307	0.6025	-0.0200	-29	-90
26 Sagittarii	6½	0.90	0.3	23 56.1	23 2.2	+ 7 32.7	-0.5151	0.6027	0.0164	-12	-76
B. A. C. 6369	6	0.94	0.7	25 7.2	8 0 8.6	+ 8 36.4	+0.6627	0.6027	0.0133	+59	- 2
B. A. C. 6448	6½	0.86	0.5	23 18.8	4 25.9	-11 16.9	-1.1880	0.6026	-0.0010	-57	-90
ψ Sagittarii	5½	0.78	1.5	25 26.7	11 49.6	- 4 11.4	+1.0300	0.6019	+0.0201	+65	+24
χ^1 Sagittarii	5½	+0.73	+1.5	-24 43.3	15 33.3	- 0 36.9	+0.3977	0.6009	+0.0305	+40	-18
χ^2 Sagittarii	6½	0.73	1.4	24 37.6	15 35.8	- 0 34.5	+0.3020	0.6009	0.0307	+34	-23
χ^3 Sagittarii	5½	0.72	1.3	24 10.7	15 39.2	- 0 31.1	-0.1477	0.6009	0.0310	+10	-49
h^1 Sagittarii	6	0.67	1.8	24 57.6	19 40.1	+ 3 19.9	+0.7868	0.6002	0.0423	+65	+ 6
h^2 Sagittarii	4½	0.67	1.8	25 7.5	19 55.4	+ 3 34.6	+0.9647	0.5999	0.0429	+65	+18
53 Sagittarii	6½	+0.64	+1.5	-23 40.6	21 8.8	+ 4 45.0	-0.4396	0.5995	+0.0436	- 5	-69
B. A. C. 6727	6	0.64	1.5	23 40.8	21 15.6	+ 4 51.5	-0.4312	0.5995	0.0466	- 5	-69
4 Capricorni	6	0.45	2.1	22 8.9	9 11 57.8	- 5 2.0	-0.9931	0.5939	0.0864	-34	-90
17 Capricorni	6	0.29	1.7	21 54.8	23 4.9	- 5 38.7	-0.1145	0.5884	0.1139	+18	-47
η Capricorni	5	0.21	1.3	20 17.4	10 6 26.2	-11 17.0	-0.8513	0.5840	0.1313	-20	-90
χ Capricorni	5½	+0.19	+1.9	-21 38.1	8 6.0	- 9 41.2	+0.7300	0.5829	+0.1350	+69	+ 1
27 Capricorni	6½	0.19	1.6	20 59.8	8 30.4	- 9 17.7	+0.1400	0.5822	0.1359	+34	-32
φ Capricorni	5½	0.15	1.9	21 6.5	10 59.3	- 6 54.5	+0.5952	0.5808	0.1414	+63	- 7
37 Capricorni	6	0.03	1.7	20 34.5	18 55.9	+ 0 44.1	+1.2460	0.5760	0.1578	+69	+43
ε Capricorni	4½	+0.01	1.7	19 57.5	19 51.9	+ 1 38.1	+0.7686	0.5751	0.1595	+70	+ 3
κ Capricorni	5	-0.02	+1.5	-19 22.0	22 11.9	+ 3 52.8	+0.5473	0.5733	+0.1628	+62	-10
29 Aquarii *mult*	6½	0.12	+0.8	17 29.6	11 6 36.0	+11 58.4	+0.0897	0.5674	0.1790	+36	-35
56 Aquarii	6½	0.27	-0.2	15 8.8	18 42.5	- 0 21.1	-0.0103	0.5605	0.1982	+34	-41
τ^1 Aquarii *mult.*	5½	0.35	0.3	14 38.1	12 2 26.6	+ 7 6.8	+1.0420	0.5551	0.2083	+75	+20
τ^2 Aquarii	4	0.36	0.5	14 10.4	3 17.5	+ 7 55.9	+0.7482	0.5545	0.2092	+74	0
74 Aquarii	6	-0.38	-0.9	-12 12.1	5 2.4	+ 9 37.2	-0.8978	0.5530	+0.2112	-13	-90
ψ^1 Aquarii	4	0.50	1.9	9 41.2	15 13.8	- 4 32.1	-1.2610	0.5478	0.2221	-41	-90
ψ^2 Aquarii	4	0.51	1.8	9 47.0	16 10.5	- 3 37.4	-0.9521	0.5474	0.2230	-15	-90
ψ^3 Aquarii	4½	0.52	1.9	10 12.7	16 39.5	- 3 9.3	-0.4060	0.5471	0.2235	+16	-65
B. A. C. 8274	7	0.64	2.7	6 59.5	13 6 27.7	+10 11.5	-0.5524	0.5415	0.2343	+10	-76
30 Piscium	4½	-0.71	-2.7	- 6 37.7	12 49.0	- 7 39.6	+0.5720	0.5391	+0.2375	+75	-10
33 Piscium	5	-0.71	-2.9	- 6 19.5	14 25.8	- 6 5.9	+0.6443	0.5384	+0.2381	+81	- 6

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
B. A. C. 17	6	-0.76	-3.2	- 5 51.6	**13** 16 48.4	- 3 47.9	+0.7336	0.5373	+0.2389	+83	- 1
14 Ceti	6	0.85	4.2	1 6.7	**14** 4 56.6	+ 7 57.1	-1.2530	0.5337	0.2420	-36	-90
15 Ceti	6½	0.86	4.3	- 1 6.7	6 10.7	+ 9 8.8	-0.9552	0.5337	0.2425	-12	-90
26 Ceti	6	0.97	4.6	+ 0 46.5	18 41.9	- 2 43.7	+0.1230	0.5320	0.2422	+47	-33
29 Ceti	6½	0.98	4.8	1 25.0	20 43.8	- 0 45.5	-0.0537	0.5314	0.2417	+37	-43
33 Ceti	6	-0.99	-4.9	+ 1 51.6	21 59.8	+ 0 28.1	-0.2083	0.5314	+0.2417	+29	-52
35 Ceti	6½	1.00	4.8	1 53.3	22 57.7	+ 1 24.1	-0.0051	0.5314	0.2414	+40	-40
f Piscium	5	1.01	4.4	3 2.0	**15** 1 32.2	+ 3 53.9	-0.5764	0.5307	0.2406	+10	-77
ν Piscium	4½	1.09	5.1	4 55.7	13 6.2	- 8 53.9	+0.2060	0.5317	0.2367	+52	-28
64 Ceti	5½	1.15	5.2	8 3.2	**16** 3 43.3	+ 5 15.9	+0.3245	0.5328	0.2276	+59	-22
ξ¹ Ceti	4½	-1.18	-5.2	+ 8 19.7	4 30.9	+ 6 1.9	+0.2123	0.5328	+0.2269	+52	-27
ξ Arietis	5½	1.16	5.3	10 6.6	10 15.0	+11 35.2	-0.3744	0.5332	0.2220	+20	-59
B. A. C. 755	6½	1.18	5.3	10 4.0	11 11.6	-11 30.0	-0.1212	0.5334	0.2211	+34	-45
31 Arietis	5½	1.25	5.3	11 58.2	15 56.6	- 6 53.9	-1.0900	0.5341	0.2168	-22	-78
38 Arietis	5	1.26	5.1	11 58.9	19 58.9	- 2 59.4	-0.2381	0.5352	0.2126	+28	-50
				NEW	*MOON.*						
ε Tauri	3½	-1.36	-2.9	+18 56.1	**18** 20 51.3	- 3 42.2	+1.1580	0.5470	+0.1415	+90	+40
ι Tauri	5	1.34	1.7	21 25.9	**19** 12 37.7	+11 32.6	+0.4647	0.5511	0.1114	+71	- 1
105 Tauri	6	1.33	1.5	21 33.6	14 49.8	-10 19.8	+0.5641	0.5513	0.1069	+80	+ 6
108 Tauri	6½	-1.32	-1.2	+22 9.6	18 14.8	- 7 1.7	+0.2663	0.5521	+0.1000	+57	-10
n Tauri	5½	1.31	1.1	21 59.0	19 59.1	- 5 21.0	+0.6304	0.5521	0.0964	+87	+10
o Tauri	6	1.29	0.9	21 50.5	23 46.9	- 1 40.9	+1.1360	0.5529	0.0884	+90	+45
121 Tauri	6	1.29	0.3	23 57.9	**20** 3 16.5	+ 1 41.4	-0.8784	0.5529	0.0810	-11	-66
B. A. C. 1801	6	1.26	-0.2	23 9.2	6 51.0	+ 5 8.7	+0.2800	0.5534	0.0734	+58	- 7
132 Tauri	5½	-1.26	0.0	+24 31.8	9 24.0	+ 7 36.4	-1.0440	0.5538	+0.0681	-24	-65
1 Geminorum	5	1.21	+0.4	23 16.1	16 15.2	- 9 46.3	+0.7537	0.5538	0.0531	+90	+21
2 Geminorum	7	1.21	0.5	23 38.8	17 27.7	- 8 36.3	+0.4015	0.5538	0.0505	+67	+ 2
3 Geminorum	6½	1.18	0.5	23 7.8	18 47.5	- 7 19.3	+1.0330	0.5536	0.0474	+90	+40
5 Geminorum	6½	1.19	0.8	24 26.6	19 34.6	- 6 33.8	-0.3687	0.5535	0.0458	+20	-40
9 Geminorum	6½	-1.17	+0.9	+23 46.7	22 3.1	- 4 10.4	+0.4654	0.5530	+0.0404	+72	+ 7
ε Geminorum	3½	1.10	1.8	25 14.4	**21** 10 12.5	+ 7 34.1	-0.8097	0.5522	0.0150	- 7	-65
37 Geminorum	6½	1.06	2.2	25 30.7	15 22.0	-11 26.8	-1.0680	0.5518	+0.0022	-27	-64
ω Geminorum	5½	1.01	2.2	24 22.2	18 37.3	- 8 18.2	+0.1817	0.5508	-0.0050	+51	- 6
48 Geminorum	6	0.96	2.5	24 18.8	23 11.6	- 3 53.2	+0.1986	0.5502	0.0150	+52	- 6
52 Geminorum	6½	-0.96	+2.7	+25 4.5	**22** 0 12.3	- 2 54.6	-0.6582	0.5499	-0.0173	+ 3	-59
A Geminorum	5½	0.92	2.9	25 15.6	4 13.6	+ 0 58.6	-0.9486	0.5487	0.0259	-17	-65
κ Geminor. *mult*	3½	0.82	3.2	24 39.7	13 53.6	+10 19.2	-0.6409	0.5463	0.0465	+ 4	-59
82 Geminorum	6½	0.79	2.9	23 24.7	15 49.5	-11 48.8	+0.6483	0.5454	0.0505	+90	+15
μ¹ Cancri	6½	0.69	3.1	22 57.0	**23** 0 5.8	- 3 48.9	+0.6717	0.5434	0.0674	+90	+15
γ Cancri	4½	-0.49	+3.4	+21 51.9	17 38.1	-10 50.9	+0.3876	0.5364	-0.1013	+65	- 5
B. A. C. 3138	6½	0.33	3.6	21 44.2	**24** 8 19.3	+ 3 22.4	-1.1520	0.5307	0.1272	-33	-68
B. A. C. 3206	6½	0.25	3.1	20 15.8	13 49.2	+ 8 41.9	-0.2417	0.5287	0.1364	+27	-41
η Leonis	3½	-0.01	2.1	17 17.9	**25** 11 9.8	+ 5 23.3	-0.2206	0.5208	0.1679	+28	-44
42 Leonis	6	+0.08	1.7	15 31.8	18 34.7	-11 25.2	+0.4460	0.5187	0.1776	+68	-10
i Leonis	5½	+0.14	+1.4	+14 42.0	23 54.4	- 6 15.1	+0.3957	0.5170	-0.1840	+64	-13
k Leonis	5½	0.21	+1.3	14 46.5	**26** 7 15.6	+ 0 53.1	-1.0730	0.5151	0.1926	-22	-75
ι Leonis *mult.*	4	0.41	0.0	11 8.1	**27** 2 49.9	- 4 7.0	-1.0470	0.5121	0.2116	-19	-79
ω Virginis	6	0.50	-1.2	8 44.6	10 28.7	+ 3 18.4	-0.0870	0.5121	0.2180	+36	-43
ξ Virginis	5½	0.53	1.1	8 52.2	14 3.8	+ 6 47.3	-1.0070	0.5113	0.2202	-16	-81
ν Virginis	4	+0.53	-1.7	+ 7 8.8	14 22.3	+ 7 5.3	+0.7905	0.5113	-0.2205	+90	+ 4
π Virginis	4½	0.62	1.9	7 13.5	22 15.2	- 9 15.5	-1.0510	0.5119	0.2255	-19	-83
11 Virginis	6	0.65	2.1	6 25.0	**28** 3 4.6	- 4 34.7	-1.2710	0.5129	0.2284	-38	-84
c Virginis	5	0.70	3.0	3 55.4	8 27.9	+ 8 39.2	+0.1753	0.5132	0.2308	+50	-31
B. A. C. 4254	6	0.79	3.4	+ 2 27.6	17 49.6	+ 9 44.5	-0.4377	0.5151	0.2342	+17	-67
65 Virginis	6	+0.80	-5.3	- 4 21.0	**29** 16 44.7	+ 7 58.5	+1.3640	0.5240	-0.2372	+86	+51
80 Virginis	6	+1.06	-5.3	- 4 50.2	22 50.0	-10 7.4	+0.4308	0.5271	-0.2364	+65	-18

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0. Δα	Red'ns from 1890.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	"	° '	d h m	h m				°	°
88 Virginis	6½	+1.11	-5.6	- 6 17.4	30 5 7.8	- 4 1.2	+0.4686	0.5298	-0.2345	+68	-16
B. A. C. 4647	6½	1.12	5.8	7 31.1	8 23.0	- 0 52.2	+0.9910	0.5319	0.2335	+82	+14
94 Virginis	6½	1.18	5.9	8 22.1	13 50.6	+ 4 25.0	+0.6025	0.5362	0.2315	+76	- 8
95 Virginis	6	+1.19	-6.1	- 8 47.4	14 2.9	+ 4 37.0	+0.9947	0.5357	-0.2310	+81	+15

JUNE.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
ζ^1 Libræ	6	+1.49	-5.9	-16 20.0	1 3 11.0	- 7 30.1	+0.6982	0.5641	-0.1961	+74	- 2
ζ^3 Libræ	6	1.50	5.7	16 13.9	4 13.8	- 6 29.5	+0.3915	0.5650	0.1945	+55	-19
ζ^4 Libræ	5½	1.51	5.7	16 28.8	5 11.8	- 5 33.5	+0.4559	0.5665	0.1932	+59	-16
β^1 Scorpii	2	+1.60	-5.1	-19 30.3	18 51.9	+ 7 36.5	+1.0230	0.5778	-0.1707	+70	+20
β^2 Scorpii	5½	1.60	5.1	19 30.1	18 52.0	+ 7 36.6	+1.0200	0.5778	0.1707	+70	+20
ν^2 Scorpii	4½	1.60	4.8	19 10.6	21 34.3	+10 12.8	+0.2369	0.5800	0.1656	+43	-27
ψ Ophiuchi	4½	1.64	4.4	19 46.9	2 2 29.6	- 9 3.2	+0.0570	0.5845	0.1559	+32	-37
ω Ophiuchi	4½	1.66	4.1	21 13.9	5 42.1	- 5 58.1	+1.0260	0.5867	0.1489	+68	+21
b Ophiuchi *var.*	5	+1.74	-2.0	-24 4.5	3 2 50.1	- 9 40.7	+1.2290	0.6025	-0.0982	+66	+45
c^2 Ophiuchi	5	1.73	1.8	23 52.7	4 45.6	- 7 49.9	+0.8521	0.6026	0.0930	+66	+ 9
63 Ophiuchi	6½	1.72	0.8	24 51.9	13 36.4	+ 0 38.9	+1.1160	0.6070	0.0686	+65	+30
4 Sagittarii	5½	1.70	0.7	23 48.3	15 27.6	+ 2 25.4	-0.0614	0.6080	0.0636	+18	-45
7 Sagittarii	6	1.70	0.5	24 16.8	16 35.6	+ 3 30.6	+0.3416	0.6084	0.0603	+39	-21
P. xvii, 330	5½	+1.70	-0.4	-23 8.4	16 54.4	+ 3 48.7	-0.8093	0.6085	-0.0594	-24	-90
9 Sagittarii	6	1.70	0.3	24 21.8	16 58.5	+ 3 52.6	+0.4014	0.6085	0.0590	+43	-18
P. xvii, 334	5½	1.68	-0.5	22 50.5	17 1.4	+ 3 55.3	-1.1160	0.6087	0.0588	-45	-90
B. A. C. 6161	5½	1.68	+0.1	23 43.5	19 54.8	+ 6 41.5	-0.3947	0.6099	0.0508	- 3	-69
λ Sagittarii	3	1.69	0.6	25 28.9	4 1 54.8	-11 33.7	+1.1010	0.6109	0.0329	+65	+30
24 Sagittarii	6	+1.65	+0.7	-24 6.8	4 8.1	- 9 26.1	-0.3245	0.6115	-0.0261	- 1	-61
25 Sagittarii	6½	1.66	0.7	24 18.3	4 22.0	- 9 12.7	-0.1391	0.6118	0.0255	+ 9	-49
B. A. C. 6343	6½	1.63	0.8	23 35.9	5 50.7	- 7 47.8	-0.8726	0.6120	0.0210	-32	-90
26 Sagittarii	6½	1.63	1.0	23 56.1	7 4.5	- 6 37.2	-0.5645	0.6121	0.0176	-14	-81
B. A. C. 6369	6	1.61	1.3	25 7.2	8 9.1	- 5 35.3	+0.5943	0.6122	-0.0142	+53	- 6
ψ Sagittarii	5½	+1.56	+2.6	-25 26.7	19 20.1	+ 5 15.8	+0.9486	0.6120	+0.0198	+65	+17
χ^1 Sagittarii	5½	1.52	2.8	24 43.3	23 6.1	+ 8 43.6	+0.3196	0.6112	0.0306	+35	-22
χ^2 Sagittarii	6½	1.52	2.8	24 37.6	23 8.6	+ 8 46.1	+0.2268	0.6112	0.0308	+29	-27
χ^3 Sagittarii	5½	1.50	2.8	24 10.7	23 11.8	+ 8 49.2	-0.2185	0.6112	0.0310	+ 6	-54
h^1 Sagittarii	6	1.52	3.3	24 57.6	5 3 5.4	-11 27.1	+0.7003	0.6101	0.0425	+64	0
h^2 Sagittarii	4½	+1.52	+3.4	-25 7.5	3 20.2	-11 13.0	+0.8726	0.6101	+0.0432	+65	+11
53 Sagittarii	6½	1.49	3.2	23 40.6	4 31.4	-10 4.8	-0.5000	0.6096	0.0465	- 8	-74
B. A. C. 6727	6	1.49	3.2	23 40.8	4 38.1	- 9 58.3	-0.4983	0.6095	0.0472	- 8	-74
4 Capricorni	6	1.30	4.1	22 8.9	18 53.9	+ 3 41.7	-1.0590	0.6036	0.0872	-39	-90
17 Capricorni	6	1.20	5.0	21 54.8	6 5 42.0	- 9 56.6	-0.1977	0.5967	0.1156	+14	-52
η Capricorni	5	+1.09	+5.0	-20 17.4	12 51.3	- 3 4.4	-0.9284	0.5915	+0.1327	-25	-90
χ Capricorni	5½	1.07	5.4	21 38.1	14 28.6	- 1 31.1	+0.6333	0.5908	0.1369	+65	- 5
27 Capricorni	6½	1.06	5.2	20 59.8	14 52.3	- 1 8.3	+0.0500	0.5908	0.1377	+29	-38
φ Capricorni	5½	1.03	5.5	21 6.5	17 17.6	+ 1 11.2	+0.5017	0.5885	0.1430	+56	-13
33 Capricorni	5½	0.98	5.8	21 19.2	20 42.4	+ 4 28.1	+1.2150	0.5860	0.1506	+69	+39
37 Capricorni	6	+0.95	+5.8	-20 34.5	7 1 2.5	+ 8 38.2	+1.1420	0.5825	+0.1592	+69	+31
ε Capricorni	4½	0.93	5.7	19 57.5	1 57.2	+ 9 30.8	+0.6711	0.5812	0.1612	+69	- 3
κ Capricorni	5	0.90	5.7	19 22.0	4 14.0	+11 42.4	+0.4515	0.5804	0.1657	+56	-13
29 Aquarii *mult.*	6½	0.77	5.4	17 29.6	12 27.6	- 4 22.6	-0.0050	0.5734	0.1812	+31	-41
56 Aquarii	6½	0.62	4.9	15 8.8	8 0 21.5	+ 7 5.3	-0.1027	0.5642	0.1995	+28	-46
τ^1 Aquarii *mult.*	5½	+0.51	+4.9	-14 38.1	7 59.2	- 9 33.3	+0.9408	0.5481	+0.2096	+75	+12
τ^2 Aquarii	4	0.50	4.7	14 10.4	8 49.4	- 8 44.8	+0.6486	0.5475	0.2105	+74	- 6
74 Aquarii	6	0.48	4.3	12 12.1	10 33.5	- 7 4.3	-0.9831	0.5468	0.2128	-19	-90
ψ^1 Aquarii	4	0.33	3.5	9 41.2	20 38.6	+ 2 40.0	-1.3480	0.5493	0.2229	-54	-90
ψ^2 Aquarii	4	0.32	3.4	9 47.0	21 34.9	+ 3 34 3	-1.0390	0.5484	0.2238	-22	-90
ψ^3 Aquarii	4½	+0.32	+3.5	-10 12.7	22 3.6	+ 4 2.1	-0.4957	0.5480	+0.2242	+12	-71
B. A. C. 8274	7	+0.16	+2.7	- 6 59.5	9 11 47.8	- 6 41.1	-0.6393	0.5407	+0.2341	+ 6	-84

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0. Δα	Red'ns from 1890.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
30 Piscium	4½	+0.08	+2.8	- 6 37.6	9 18 8.7	- 0 32.6	+0.4838	0.5382	+0.2369	+68	-15
33 Piscium	5	0.06	2.6	6 19.4	19 45.5	+ 1 1.1	+0.5541	0.5371	0.2380	+74	-11
B. A. C. 17	6	+0.03	2.3	5 51.5	22 8.2	+ 3 19.2	+0.6426	0.5365	0.2390	+81	- 6
14 Ceti	6	-0.09	1.0	1 6.6	10 10 19.1	- 8 53.1	-1.3370	0.5317	0.2416	-46	-90
15 Ceti	6½	0.10	0.9	- 1 6.6	11 33.4	- 7 41.1	-1.0380	0.5309	0.2416	-18	-90
26 Ceti	6	-0.22	+0.6	+ 0 46.6	11 0 10.4	+ 4 32.2	+0.0469	0.5278	+0.2410	+43	-38
29 Ceti	6½	0.25	+0.2	1 25.1	2 13.8	+ 6 31.8	-0.1270	0.5279	0.2410	+34	-47
33 Ceti	6	0.26	0.0	1 51.7	3 30.2	+ 7 45.8	-0.2835	0.5273	0.2403	+25	-57
35 Ceti	6½	0.27	+0.3	1 53.4	4 28.6	+ 8 42.4	-0.0801	0.5273	0.2403	+36	-45
f Piscium	5	0.30	-0.2	3 2.1	7 4.8	+11 13.8	-0.6498	0.5272	0.2395	+ 6	-83
ν Piscium	4½	-0.22	-0.6	+ 4 55.8	18 47.1	- 1 25.4	+0.1400	0.5266	+0.2345	+48	-32
64 Ceti	5½	0.54	1.2	8 3.3	12 9 36.3	-11 3.7	+0.2699	0.5278	0.2261	+56	-24
ξ^1 Ceti	4½	0.55	1.3	8 19.8	10 24.6	-10 17.0	+0.1605	0.5278	0.2254	+49	-30
ξ Arietis	5½	0.61	1.8	10 6.7	16 13.8	- 4 38.6	-0.4293	0.5280	0.2205	+18	-63
B. A. C. 755	6½	0.62	1.8	10 4.1	17 11.4	- 3 42.8	-0.1732	0.5280	0.2196	+31	-47
31 Arietis	5½	-0.66	-2.2	+11 58.3	22 0.7	+ 0 57.6	-1.1440	0.5288	+0.2153	-27	-78
38 Arietis	5	0.68	1.9	11 59.0	13 2 6.9	+ 4 56.1	-0.2837	0.5299	0.2112	+25	-53
Lalande 5725	6	0.76	1.9	12 46.0	12 34.8	- 8 55.7	+1.0350	0.5329	0.1999	+90	+23
B. A. C. 1119	6	0.86	2.1	16 10.7	14 4 27.8	+ 6 27.1	+0.3943	0.5370	0.1786	+64	-12
B. A. C. 1206	6	0.90	2.0	16 59.9	10 59.8	-11 13.5	+0.6481	0.5391	0.1689	+87	+ 3
B. A. C. 1240	6	-0.93	-2.1	+17 53.0	14 36.4	- 7 43.9	+0.2949	0.5379	+0.1633	+58	-16
ω^1 Tauri	6	0.96	2.1	19 19.0	18 31.5	- 3 56.5	-0.6269	0.5419	0.1571	+ 6	-67
ω^2 Tauri	5½	0.98	2.0	20 18.4	22 19.4	- 0 16.0	-1.1120	0.5424	0.1504	-28	-70
NEPTUNE				19 35.8	23 37.2	+ 0 59.3	-0.1498	0.5420	0.1482	+32	-37
ε Tauri	3½	0.97	-1.5	18 56.2	15 3 39.4	+ 4 53.5	+1.1500	0.5440	0.1412	+90	+39
				NEW	*MOON.*						
ε Geminorum	3½	-1.03	+1.5	+25 14.4	17 17 21.8	- 7 28.9	-0.7996	0.5535	+0.0138	- 7	-65
ω Geminorum	5½	0.96	1.9	24 22.2	18 1 46.8	+ 0 38.9	+0.1970	0.5522	-0.0046	+52	- 5
48 Geminorum	6	0.95	2.2	24 18.8	6 21.1	+ 5 3.9	+0.2155	0.5514	0.0149	+54	- 5
52 Geminorum	6½	-0.96	+2.3	+25 4.5	7 21.9	+ 6 2.7	-0.6428	0.5509	-0.0169	+ 3	-57
A Geminorum	5½	0.94	2.5	25 15.6	11 23.0	+ 9 55.6	-0.9319	0.5498	0.0256	-16	-65
κ Geminor. *mult.*	3½	0.88	3.0	24 39.7	21 2.8	- 4 44.0	-0.6219	0.5476	0.0463	+ 5	-58
82 Geminorum	6½	0.86	2.8	23 24.7	22 58.4	- 2 52.3	+0.6699	0.5470	0.0505	+90	+16
μ^1 Cancri	6½	0.80	3.1	22 57.0	19 7 14.5	+ 5 7.4	+0.6932	0.5448	0.0674	+90	+16
γ Cancri	4½	-0.66	+3.6	+21 51.9	20 0 45.9	- 1 55.4	+0.4123	0.5375	-0.1013	+67	- 3
B. A. C. 3138	6½	0.53	4.0	21 44.2	15 27.4	-11 41.9	-1.1300	0.5319	0.1275	-31	-68
B. A. C. 3206	6½	0.47	3.7	20 15.8	20 57.9	- 6 21.8	-0.2185	0.5296	0.1369	+28	-40
η Leonis	3½	0.26	3.2	17 17.9	21 18 23.3	- 9 35.6	-0.1978	0.5204	0.1679	+30	-42
42 Leonis	6	0.19	3.0	15 31.8	22 1 51.2	- 2 21.1	+0.4724	0.5177	0.1774	+70	- 9
i Leonis	5½	-0.13	+2.7	+14 42.0	7 13.2	+ 2 51.4	+0.4200	0.5153	-0.1834	+66	-12
k Leonis	5½	-0.06	2.6	14 46.5	14 38.4	+10 3.5	-1.0550	0.5128	0.1918	-21	-75
ι Leonis *mult.*	4	+0.14	1.6	11 8.1	23 10 27.4	+ 5 18.2	-1.0350	0.5083	0.2101	-18	-79
ω Virginis	6	0.22	0.6	8 44.6	18 13.5	-11 9.0	-0.0693	0.5080	0.2163	+37	-42
ξ Virginis	5½	0.26	0.8	8 52.2	21 51.9	- 7 36.9	-0.9982	0.5074	0.2186	-16	-81
ν Virginis	4	+0.26	+0.1	+ 7 8.8	22 10.8	- 7 18.5	+0.8160	0.5074	-0.2190	+90	+ 6
π Virginis	4½	0.34	0.0	7 13.6	24 6 12.2	+ 0 29.2	-1.0460	0.5074	0.2235	-18	-83
11 Virginis	6	0.38	-0.3	6 25.1	11 7.4	+ 5 15.6	-1.2700	0.5078	0.2261	-38	-84
c Virginis	5½	0.46	1.2	3 55.5	16 36.8	+10 35.9	+0.1877	0.5075	0.2284	+51	-30
B. A. C. 4254	6	0.54	1.5	+ 2 27.6	25 2 10.4	- 4 6.9	-0.4280	0.5093	0.2318	+18	-66
65 Virginis	6	+0.79	-3.7	- 4 21.0	26 1 37.1	- 5 21.1	+1.3850	0.5166	-0.2341	+86	+57
80 Virginis	6	0.87	3.9	4 50.2	7 51.0	+ 0 41.6	+0.4434	0.5196	0.2332	+67	-17
88 Virginis	6½	0.94	4.4	6 17.4	14 17.5	+ 6 56.4	+0.4806	0.5234	0.2319	+68	-15
B. A. C. 4647	6½	0.98	4.6	7 31.1	17 37.2	+10 10.0	+1.0035	0.5249	0.2304	+82	+15
94 Virginis	6½	1.05	4.9	8 22.1	23 12.1	- 8 25.5	+0.6148	0.5284	0.2286	+77	- 8
95 Virginis	6	+1.05	-5.0	- 8 47.4	23 24.6	- 8 13.4	+1.0090	0.5284	-0.2281	+81	+17
κ Virginis	4½	+1.08	-5.1	- 9 45.8	27 2 24.9	- 5 18.7	+1.3440	0.5307	-0.2265	+80	+50

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"	° '	d h m	h m				°	°
JUNE.											
o^1 Libræ	6½	+1.45	-5.6	-15 9.1	28 10 4.6	+ 1 18.3	+0.1179	0.5567	-0.1988	+40	-34
o^2 Libræ	6½	1.46	5.3	14 44.6	10 58.4	+ 2 10.3	-0.4768	0.5581	0.1976	+ 9	-71
ζ^1 Libræ	6	1.49	5.6	16 20.0	13 15.1	+ 4 22.2	+0.7047	0.5600	0.1947	+74	- 2
ζ^2 Libræ	7	1.51	5.8	17 3.8	13 49.7	+ 4 55.6	+1.3380	0.5598	0.1935	+73	+57
ζ^3 Libræ	6	1.51	5.6	16 13.9	14 18.9	+ 5 23.7	+0.3936	0.5603	0.1931	+56	-19
ζ^4 Libræ	5½	+1.51	-5.5	-16 28.8	15 17.7	+ 6 20.5	+0.4582	0.5611	-0.1919	+59	-16
β^1 Scorpii	2	1.68	5.2	19 30.3	29 5 7.0	- 4 20.2	+1.0290	0.5747	0.1698	+70	+20
β^3 Scorpii	5½	1.68	5.2	19 30.1	5 7.1	- 4 20.1	+1.0230	0.5747	0.1698	+70	+20
ν^2 Scorpii	4½	1.70	4.9	19 10.6	7 50.9	- 1 42.5	+0.2378	0.5773	0.1647	+43	-27
ψ Ophiuchi	4½	1.76	4.6	19 46.9	12 48.1	+ 3 3.4	+0.0555	0.5822	0.1551	+32	-37
ω Ophiuchi	4½	+1.80	-4.5	-21 13.9	16 1.7	+ 6 9.5	+1.1024	0.5856	-0.1506	+69	+20
b Ophiuchi *var.*	5	2.01	2.6	24 4.4	30 13 10.1	+ 2 27.4	+1.2280	0.5929	0.0982	+66	+45
c^2 Ophiuchi	5	+2.01	-2.4	-23 52.6	15 5.1	+ 4 17.7	+0.8476	0.6039	-0.0932	+66	+ 9
JULY.											
4 Sagittarii	5½	+2.08	-1.0	-23 48.3	1 1 42.2	- 9 31.8	-0.0577	0.6110	-0.0636	+17	-44
P. xvii, 330	5½	2.07	0.7	23 8.4	3 8.1	- 8 9.5	-0.8052	0.6122	0.0593	-28	-90
B. A. C. 6161	5½	2.09	-0.4	23 43.5	6 6.4	- 5 18.8	-0.3887	0.6134	0.0508	- 2	-65
λ Sagittarii	3	2.14	+0.4	25 28.9	12 1.7	+ 0 21.3	+1.0980	0.6155	-0.0329	+65	+30
ψ Sagittarii	5½	+2.15	+2.9	-25 26.7	2 5 17.7	- 7 7.5	+0.9460	0.6176	+0.0203	+65	+17
χ^1 Sagittarii	5½	2.18	3.4	24 43.3	8 50.1	- 3 44.3	+0.3273	0.6176	0.0313	+36	-22
χ^2 Sagittarii	6½	2.13	3.4	24 37.6	8 52.4	- 3 42.1	+0.2357	0.6176	0.0313	+30	-27
χ^3 Sagittarii	5½	2.12	3.4	24 10.7	8 55.5	- 3 39.1	-0.2030	0.6176	0.0314	+ 7	-53
h^1 Sagittarii	6	2.12	4.0	24 57.6	12 43.9	- 0 0.6	+0.7053	0.6174	0.0432	+64	0
h^2 Sagittarii	4½	+2.11	+4.0	-25 7.5	12 58.4	+ 0 13.5	+0.8788	0.6172	+0.0439	+65	+12
53 Sagittarii	6½	2.09	4.1	23 40.6	14 7.9	+ 1 19.8	-0.4895	0.6172	0.0474	- 8	-74
B. A. C. 6727	6	2.09	4.1	23 40.8	14 14.4	+ 1 26.0	-0.4811	0.6172	0.0478	- 7	-73
4 Capricorni	6	2.11	5.7	22 8.8	3 4 8.1	- 9 16.1	-1.0330	0.6130	0.0889	-37	-90
17 Capricorni	6	1.92	7.0	21 54.7	14 37.4	+ 0 46.7	-0.1786	0.6073	0.1180	+15	-51
η Capricorni	5	+1.84	+7.5	-20 17.3	21 33.8	+ 7 25.9	-0.8966	0.6013	+0.1352	-23	-90
χ Capricorni	5½	1.84	7.9	21 38.0	23 8.0	+ 8 56.2	+0.6426	0.6002	0.1386	+65	- 4
27 Capricorni	6½	1.82	7.8	20 59.7	23 30.9	+ 9 18.2	+0.0673	0.6008	0.1402	+30	-36
φ Capricorni	5½	1.83	8.2	21 6.4	4 1 51.6	+11 33.1	+0.5139	0.5985	0.1458	+57	-12
33 Capricorni	5½	1.77	8.5	21 19.1	5 10.1	- 9 16.3	+1.2170	0.5956	0.1532	+69	+39
37 Capricorni	6	+1.74	+8.8	-20 34.4	9 21.9	- 5 14.6	+1.1450	0.5929	+0.1625	+69	+31
ε Capricorni	4½	1.73	8.7	19 57.4	10 14.9	- 4 23.7	+0.6810	0.5919	0.1642	+69	- 3
κ Capricorni	5	1.75	8.8	19 21.9	12 27.3	- 2 16.5	+0.4661	0.5905	0.1690	+57	-15
29 Aquarii *mult.*	6½	1.66	9.1	17 29.5	20 25.0	+ 5 22.6	+0.0214	0.5825	0.1841	+33	-39
56 Aquarii	6½	1.35	9.1	15 8.7	5 7 56.0	- 7 32.5	-0.0730	0.5738	0.2032	+30	-45
τ^1 Aquarii *mult.*	5½	+1.33	+9.5	-14 38.0	15 19.3	- 0 25.5	+0.9583	0.5675	+0.2131	+75	+14
τ^2 Aquarii	4	1.32	9.3	14 10.3	16 8.1	+ 0 21.5	+0.6705	0.5666	0.2142	+75	- 4
74 Aquarii	6	1.30	9.0	12 12.0	17 48.8	+ 1 58.6	-0.9385	0.5658	0.2163	-16	-90
ψ^1 Aquarii	4	1.21	8.7	9 41.1	6 3 36.1	+11 25.1	-1.2925	0.5581	0.2268	-45	-90
ψ^2 Aquarii	4	1.20	8.7	9 46.9	4 30.7	-11 42.2	-0.9915	0.5565	0.2274	-18	-90
ψ^3 Aquarii	4½	+1.19	+8.8	-10 12.6	4 58.8	-11 15.1	-0.4538	0.5564	+0.2278	+14	-68
B. A. C. 8274	7	1.10	8.1	6 59.4	18 20.9	+ 1 39.5	-0.5929	0.5483	0.2375	+ 8	-80
30 Piscium	4½	0.96	8.2	6 37.5	7 0 32.7	+ 7 39.0	+0.5187	0.5445	0.2403	+71	-13
33 Piscium	5	0.94	8.0	6 19.3	2 7.2	+ 9 10.3	+0.5882	0.5432	0.2407	+77	- 9
B. A. C. 17	6	0.91	7.9	5 51.4	4 26.6	+11 25.1	+0.6773	0.5421	0.2417	+83	- 5
14 Ceti	6	+0.95	+6.6	- 1 6.5	16 22.3	- 1 2.5	-1.2800	0.5359	+0.2438	-38	-90
15 Ceti	6½	0.74	6.5	- 1 6.5	17 35.4	+ 0 8.2	-0.9845	0.5362	0.2440	-14	-90
26 Ceti	6	0.63	6.1	+ 0 46.7	8 6 0.1	-11 50.7	+0.0931	0.5317	0.2430	+46	-35
29 Ceti	6½	0.60	5.8	1 25.2	8 1.8	- 9 52.8	-0.0810	0.5307	0.2420	+36	-45
33 Ceti	6	0.58	5.5	1 51.8	9 17.2	- 8 39.8	-0.2367	0.5307	0.2420	+28	-53
35 Ceti	6½	+0.57	+5.8	+ 1 53.5	10 14.8	- 7 44.0	-0.0328	0.5304	+0.2416	+39	-42
f Piscium	5	+0.54	+5.2	+ 3 2.2	12 49.0	- 5 14.6	-0.6020	0.5297	+0.2409	+ 9	-79

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"	° '	d h m	h m				°	°
ν Piscium	4½	+0.43	+4.9	+ 4 55.9	9 0 24.4	+ 5 59.1	+0.1864	0.5284	+0.2355	+51	-29
64 Ceti	5½	0.26	3.7	8 3.4	15 8.5	- 3 44.2	+0.3147	0.5277	0.2261	+59	-22
ξ^1 Ceti	4½	0.25	3.6	8 19.9	15 56.7	- 2 57.5	+0.2056	0.5274	0.2252	+52	-27
ξ Arietis	5½	0.19	2.8	10 6.8	21 44.8	+ 2 39.8	-0.3820	0.5270	0.2200	+20	-59
B. A. C. 755	6½	0.18	2.8	10 4.2	22 42.4	+ 3 35 6	-0.1287	0.5280	0.2194	+33	-45
31 Arietis	5½	+0.15	+2.3	+11 58.4	10 3 31.5	+ 8 15.8	-1.0990	0.5280	+0.2147	-23	-78
38 Arietis	5	+0.11	2.4	11 59.1	7 37.8	-11 45.6	-0.2407	0.5283	0.2103	+27	-50
Lalande 5725	6	-0.11	2.0	12 46.0	18 7.1	- 1 36.0	+1.0780	0.5304	0.1986	+90	+26
B. A. C. 1119	6	0.14	1.1	16 10.7	11 10 4.5	-10 8.8	+0.4319	0.5339	0.1774	+67	-10
B. A. C. 1206	6	0.20	1.0	16 59.9	16 38.9	- 3 47.0	+0.6833	0.5362	0.1676	+90	+ 5
B. A. C. 1240	6	-0.25	+0.6	+17 53.0	20 16.8	- 0 16.1	+0.3297	0.5370	+0.1622	+60	-14
ω^1 Tauri	6	0.24	-0.6	19 19.0	12 0 13.8	+ 3 33.2	-0.5926	0.5378	0.1555	+ 8	-65
ω^2 Tauri	5½	0.28	+0.3	20 18.4	4 3.3	+ 7 15.3	-1.0830	0.5391	0.1491	-25	-70
NEPTUNE				19 43.6	7 7.2	+10 13.2	-0.0072	0.5391	0.1437	+40	-29
ε Tauri	3½	0.33	0.7	18 56.2	9 25.9	-11 32.6	+1.1790	0.5405	0.1394	+90	+43
W. iv, 650	6	-0.36	+0.3	+20 27.8	13 56.2	- 7 11.1	+0.1341	0.5419	+0.1319	+48	-21
ι Tauri	5	0.43	0.5	21 25.9	13 1 29.0	+ 3 58.9	+0.4809	0.5463	0.1104	+72	0
105 Tauri	6	0.45	0.5	21 33.6	3 43.4	+ 6 8.8	+0.5848	0.5465	0.1060	+82	+ 7
108 Tauri	6½	0.48	0.5	22 9.6	7 11.7	+ 9 30.2	+0.2841	0.5469	0.0989	+57	-10
n Tauri	5½	0.50	0.5	21 59.0	8 57.6	+11 12.5	+0.6496	0.5479	0.0957	+90	+11
ο Tauri	6	-0.51	+0.6	+21 50.5	12 48.8	- 9 4.0	+1.1570	0.5482	+0.0875	+90	+46
121 Tauri	6	0.54	0.4	23 57.9	16 21.2	- 5 38.7	-0.8722	0.5494	0.0805	-11	-66
B. A. C. 1801	6	0.56	0.5	23 9.2	19 59.1	- 2 8.1	+0.2985	0.5504	0.0729	+60	- 6
132 Tauri	5½	0.58	0.6	24 31.8	22 33.4	+ 0 20.9	-1.0370	0.5502	0.0674	-24	-65
1 Geminorum	5	0.58	0.9	23 16.1	14 5 29.2	+ 7 2.8	+0.7689	0.5509	0.0527	+90	+22
2 Geminorum	7	-0.59	+0.9	+23 38.8	6 42.5	+ 8 13.6	+0.4166	0.5509	+0.0490	+68	+ 3
3 Geminorum	6½	0.59	0.9	23 7.8	8 3.1	+ 9 31.4	+1.0500	0.5509	0.0472	+90	+41
5 Geminorum	6½	0.61	0.8	24 26.6	8 50.7	+10 17.4	-0.3596	0.5508	0.0453	+20	-39
9 Geminorum	6½	0.61	1.0	23 46.7	11 20.4	-11 18.0	+0.4779	0.5517	0.0399	+73	+ 7
ε Geminorum	3½	0.61	1.3	25 14.4	23 35.6	+ 0 31.9	-0.8085	0.5514	+0.0131	- 7	-65
MERCURY				+23 24.1	15 14 22.1	- 9 11.0	+1.1830	0.4539	-0.0139	+90	+56
				NEW	*MOON.*						
γ Cancri	4½	-0.69	+3.1	21 51.9	17 7 8.5	+ 6 14.7	+0.3655	0.5391	0.1027	+63	- 6
B. A. C. 3206	6½	0.50	3.5	20 15.8	18 3 20.9	+ 1 48.7	-0.2820	0.5305	0.1375	+25	-44
η Leonis	3½	-0.37	+3.4	+17 17.9	19 0 48.2	- 1 23.2	-0.2815	0.5210	-0.1688	+25	-47
42 Leonis	6	0.32	3.3	15 31.8	8 15.9	+ 5 51.1	+0.3864	0.5176	0.1780	+64	-13
i Leonis	5½	0.27	3.2	14 42.0	13 38.6	+11 4.3	+0.3328	0.5160	0.1845	+60	-17
k Leonis	5½	0.22	3.2	14 46.5	21 5.5	- 5 41.9	-1.1550	0.5125	0.1925	-29	-75
ι Leonis *mult.*	4	0.07	2.2	11 8.1	20 17 0.9	-10 20.8	-1.1490	0.5077	0.2105	-27	-79
ω Virginis	6	-0.01	+1.8	+ 8 44.6	21 0 50.9	- 2 44.1	-0.1835	0.5062	-0.2163	+31	-49
ξ Virginis	5½	+0.02	2.0	8 52.2	4 31.3	+ 0 50.1	-1.1190	0.5051	0.2183	-24	-81
ν Virginis	4	0.02	1.4	7 8.8	4 50.4	+ 1 8.7	+0.7052	0.5052	0.2185	+90	- 2
π Virginis	4½	0.10	1.3	7 13.6	12 57.2	+ 9 1.8	-1.1740	0.5049	0.2231	-28	-83
c Virginis	5½	0.18	+0.3	3 55.5	23 30.1	- 4 43.2	+0.0619	0.5050	0.2277	+45	-36
B. A. C. 4254	6	+0.27	-0.1	+ 2 27.7	22 9 12.7	+ 4 43.0	-0.5644	0.5055	-0.2305	+11	-76
65 Virginis	6	0.51	2.1	- 4 21.0	23 9 7.0	+ 3 56.4	+1.2680	0.5113	0 2319	+86	+37
66 Virginis	6	0.52	2.3	4 35.4	9 45.2	+ 4 33.5	+1.3760	0.5111	0.2315	+85	+54
80 Virginis	6	0.59	2.3	4 50.2	15 29.6	+10 7.9	+0.3130	0.5139	0.2308	+59	-24
88 Virginis	6½	0.67	2.9	6 17.4	22 5.5	- 7 27.8	+0.3530	0.5170	0.2291	+60	-22
B. A. C 4647	6½	+0.70	-3.0	- 7 31.1	24 1 30.3	- 4 9.2	+0.8843	0.5189	-0.2278	+82	+ 8
94 Virginis	6½	0.76	3.4	8 22.1	7 13.9	+ 1 24.2	+0.4895	0.5217	0.2253	+68	-15
95 Virginis	6	0.71	3.6	8 47.4	7 26.7	+ 1 36.5	+0.8902	0.5219	0.2252	+81	+ 8
κ Virginis	4½	0.80	3.8	9 45.8	10 31.9	+ 4 36.1	+1.2270	0.5226	0.2232	+80	+34
o^1 Libræ	6½	1.23	4.9	15 9.1	25 19 5.3	-11 53.0	+0.0057	0.5474	0.1950	+34	-40
o^2 Libræ	6½	+1.24	-4.5	-14 44.6	20 0.8	-10 59.4	-0.6003	0.5488	-0.1940	+ 3	-81
ζ^1 Libræ	6	+1.28	-5.0	-16 20.0	22 21.5	- 8 43.5	+0.5993	0.5503	-0.1909	+70	- 8

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0. Δα	Red'ns from 1890.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	"	° '	d h m	h m				°	°
ζ^2 Libræ	7	+1.29	- 5.3	-17 3.8	25 22 56.9	- 8 9.3	+1.2440	0.5513	-0.1901	+73	+39
ζ^3 Libræ	6	1.29	5.3	16 13.9	23 27.0	- 7 40.2	+0.2867	0.5524	0.1894	+48	-25
ζ^4 Libræ	5½	1.29	4.9	16 28.8	26 0 27.5	- 6 41.8	+0.3523	0.5536	0.1883	+53	-21
47 Libræ	6½	1.45	5.2	19 3.5	10 10.2	+ 2 40.6	+1.2480	0.5619	0.1748	+71	+42
β^1 Scorpii	2	1.51	5.1	19 30.3	14 39.9	+ 7 0.7	+0.9350	0.5652	0.1661	+70	+13
β^2 Scorpii	5½	+1.51	- 5.1	-19 30.1	14 40.0	+ 7 0.8	+0.9315	0.5652	-0.1661	+70	+13
ν^2 Scorpii	4½	1.54	4.7	19 10.6	17 28.0	+ 9 42.6	+0.1414	0.5681	0.1616	+37	-33
ψ Ophiuchi	4½	1.62	4.5	19 46.9	22 33.1	- 9 23.5	-0.0391	0.5740	0.1521	+26	-43
ω Ophiuchi	4½	1.67	4.6	21 13.9	27 1 51.6	- 6 12.4	+0.9455	0.5773	0.1457	+69	+15
b Ophiuchi *var.*	5	1.99	3.3	24 4.5	23 28.1	- 9 26.4	+1.1720	0.5965	0.0963	+66	+37
c^2 Ophiuchi	5	+2.00	- 3.1	-23 52.7	28 1 25.4	- 7 33.8	+0.7896	0.5976	-0.0912	+66	+ 5
63 Ophiuchi	6½	2.12	2.1	24 51.9	10 21.2	+ 0 59.9	+1.0670	0.6054	0.0666	+65	+26
4 Sagittarii	5½	2.13	1.7	23 48.3	12 13.0	+ 2 47.1	-0.1130	0.6060	0.0617	+14	-47
7 Sagittarii	6	2.16	0.6	24 16.8	13 21.2	+ 3 52.6	+0.2940	0.6070	0.0586	+36	-24
P. xvii, 330	5½	2.12	1.2	23 8.4	13 40.1	+ 4 10.7	-0.8620	0.6073	0.0580	-28	-90
9 Sagittarii	6	+2.15	- 1.5	-24 21.8	13 44.2	+ 4 14.6	+0.3522	0.6075	-0.0576	+39	-20
B. A. C. 6161	5½	2.16	0.9	23 43.5	16 40.9	+ 7 4.2	-0.4470	0.6074	0.0492	- 4	-70
λ Sagittarii	3	2.25	- 0.4	25 28.9	22 40.3	-11 11.9	+1.0610	0.6110	0.0314	+65	+26
24 Sagittarii	6	2.25	0.0	24 6.8	29 0 52.7	- 9 5.2	-0.3547	0.6128	0.0249	- 3	-63
25 Sagittarii	6½	2.25	0.0	24 18.3	1 7.0	- 8 51.4	-0.1716	0.6130	0.0244	+ 8	-51
B. A. C. 6343	6½	+2.23	+ 0.4	-23 35.9	2 35.1	- 7 27.1	-0.9010	0.6131	-0.0197	-33	-90
26 Sagittarii	6½	2.27	0.6	23 56.1	3 48.2	- 6 17.2	-0.5913	0.6139	0.0160	-16	-84
B. A. C. 6369	6	2.30	0.5	25 7.2	4 52.3	- 5 15.8	+0.5649	0.6148	-0.0128	+50	- 8
ψ Sagittarii	5½	2.38	2.2	25 26.7	16 3.3	+ 5 26.3	+0.9311	0.6169	+0.0214	+65	+16
χ^1 Sagittarii	5½	2.38	2.9	24 43.3	19 36.0	+ 8 49.8	+0.3143	0.6167	0.0330	+35	-22
χ^2 Sagittarii	6½	+2.38	+ 2.9	-24 37.6	19 38.4	+ 8 52.1	+0.2226	0.6167	+0.0330	+29	-27
χ^3 Sagittarii	5½	2.38	3.0	24 10.7	19 41.5	+ 8 55.1	-0.2160	0.6167	0.0330	+ 6	-54
h^1 Sagittarii	6	2.41	3.5	24 57.6	23 30.0	-11 26.2	+0.6988	0.6176	0.0453	+64	0
h^2 Sagittarii	4½	2.41	3.5	25 7.5	23 44.4	-11 12.5	+0.8708	0.6176	0.0456	+65	+11
53 Sagittarii	6½	2.40	3.8	23 40.6	30 0 53.9	-10 6.0	-0.4952	0.6167	0.0486	- 8	-74
B. A. C. 6727	6	+2.40	+ 3.8	-23 40.8	1 0.3	- 9 59.9	-0.4870	0.6167	+0.0486	- 8	-73
4 Capricorni	6	2.40	4.9	22 8.8	14 50.3	+ 3 14.3	-1.0150	0.6148	0.0907	-35	-90
17 Capricorni	6	2.40	7.6	21 54.7	31 1 13.5	-10 49.0	-0.1499	0.6110	0.1166	+16	-49
η Capricorni	5	2.36	8.6	20 17.3	8 4.3	- 4 15.4	-0.8519	0.6067	0.1375	-20	-90
χ Capricorni	5½	2.36	8.8	21 38.0	9 37.1	- 2 46.5	+0.6792	0.6060	0.1426	+67	- 2
27 Capricorni	6½	+2.34	+ 8.9	-20 59.7	9 59.7	- 2 24.9	+0.1108	0.6053	+0.1427	+33	-34
ϕ Capricorni	5½	2.35	9.2	21 6.4	12 18.1	- 0 12.2	+0.5554	0.6043	0.1479	+60	-10
ε Capricorni	4½	2.29	10.2	19 57.3	20 32.1	+ 7 41.6	+0.7313	0.5980	0.1678	+70	0
κ Capricorni	5	+2.26	+10.4	-19 21.8	22 41.9	+ 9 46.2	+0.5229	0.5965	+0.1722	+60	-12

AUGUST.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
29 Aquarii *mult*	6½	+2.22	+11.1	-17 29.4	1 6 29.1	- 6 45.2	+0.0948	0.5912	+0.1886	+37	-35
56 Aquarii	6½	2.10	11.9	15 8.6	17 42.9	+ 4 2.4	+0.0164	0.5821	0.2075	+35	-39
τ^1 Aquarii *mult.*	5½	2.05	12.5	14 37.9	2 0 54.2	+10 57.4	+1.0450	0.5762	0.2179	+75	+20
τ^2 Aquarii	4	+2.04	+12.5	-14 10.2	1 41.6	+11 43.0	+0.7634	0.5755	+0.2191	+72	+ 1
74 Aquarii	6	2.02	12.3	12 11.9	3 19.6	-10 42.6	-0.8194	0.5738	0.2206	- 9	-90
ψ^1 Aquarii	4	1.92	12.4	9 41.0	12 49.4	- 1 33.6	-1.1600	0.5672	0.2316	-31	-90
ψ^2 Aquarii	4	1.91	12.5	9 46.8	13 42.4	- 0 42.6	-0.8547	0.5661	0.2324	- 9	-90
ψ^3 Aquarii	4½	1.90	12.5	10 12.5	14 9.6	- 0 16.2	-0.3283	0.5659	0.2327	+20	-60
B. A. C. 8274	7	+1.78	+12.5	- 6 59.3	3 3 6.7	-11 46.9	-0.3804	0.5571	+0.2424	+19	-63
30 Piscium	4½	1.71	12.7	6 37.4	9 6.6	- 5 59.3	+0.6516	0.5534	0.2452	+81	- 6
33 Piscium	4½	1.70	12.6	6 19.2	10 38.1	- 4 30.9	+0.7228	0.5530	0.2461	+84	- 2
B. A. C. 17	6	1.68	12.5	5 51.3	12 53.0	- 2 20.7	+0.8122	0.5518	0.2468	+84	+ 3
14 Ceti	6	1.57	11.6	1 6.4	4 0 26.2	+ 8 49.2	-1.1040	0.5452	0.2487	-23	-90
15 Ceti	6½	+1.55	+11.5	- 1 6.4	1 37.2	+ 9 57.7	-0.8097	0.5441	+0.2485	- 4	-90
26 Ceti	6	+1.43	+11.1	+ 0 46.8	13 38.9	- 2 24.2	+0.2580	0.5398	+0.2471	+55	-26

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"	° '	d h m	h m				°	°
29 Ceti	6½	+1.40	+10.8	+ 1 25.3	4 15 36.9	- 0 30.0	+0.0884	0.5390	+0.2464	+45	-35
33 Ceti	6	1.39	10.6	1 51.9	16 50.1	+ 0 40.8	-0.0629	0.5382	0.2459	+37	-44
35 Ceti	6½	1.38	10.7	1 53.6	17 46.1	+ 1 35.0	+0.1379	0.5387	0.2458	+48	-33
f Piscium	5	1.35	10.3	3 2.3	20 15.7	+ 3 59.8	-0.4232	0.5379	0.2451	+18	-66
ν Piscium	4½	1.26	10.0	4 56.0	5 7 31.8	- 9 5.9	+0.3591	0.5352	0.2388	+61	-21
64 Ceti	5½	+1.11	+ 8.6	+ 8 3.4	21 53.9	+ 4 48.8	+0.4896	0.5333	+0.2285	+71	-13
ξ^1 Ceti	4½	1.10	8.5	8 19.9	22 40.9	+ 5 34.2	+0.3819	0.5331	0.2276	+63	-18
ξ Arietis	5½	1.05	7.7	10 6.8	6 4 21.5	+11 4.1	-0.1986	0.5328	0.2225	+30	-49
B. A. C. 755	6½	1.05	7.7	10 4.2	5 17.7	+11 58.4	+0.0597	0.5325	0.2216	+45	-34
31 Arietis	5½	1.01	6.9	11 58.4	10 0.8	- 7 27.4	-0.9055	0.5325	0.2166	-10	-78
38 Arietis	5	+0.96	+ 6.9	+11 59.1	14 2.3	- 3 33.6	-0.0579	0.5334	+0.2123	+37	-39
Lalande 5725	6	0.87	6.4	12 46.1	7 0 20.9	+ 6 25.2	+1.2435	0.5337	0.1999	+90	+41
B. A. C. 1119	6	0.71	4.8	16 10.8	16 5.4	- 2 20.5	+0.5979	0.5358	0.1778	+81	- 2
B. A. C. 1206	6	0.63	4.5	17 0.0	22 35.6	+ 3 57.1	+0.8447	0.5370	0.1672	+90	+14
B. A. C. 1240	6	0.63	4.0	17 53.1	8 2 11.8	+ 7 26.3	+0.4884	0.5378	0.1617	+72	- 6
ω^1 Tauri	6	+0.60	+ 3.4	+19 19.1	6 6.7	+11 13.5	-0.4309	0.5395	+0.1555	+17	-55
ω^2 Tauri	5½	0.55	3.1	20 18.5	9 54.6	- 9 5.8	-0.9226	0.5400	0.1489	-13	-70
NEPTUNE				19 49.9	14 11.6	- 4 57.3	+0.2072	0.5402	0.1413	+53	-18
W. iv, 650	6	0.44	2.8	20 27.9	19 44.3	+ 0 24.4	+0.2834	0.5418	0.1308	+57	-12
ι Tauri	5	0.45	2.5	21 26.0	9 7 15.1	+11 32.4	+0.6170	0.5449	0.1096	+86	+ 8
105 Tauri	6	+0.32	+ 2.3	+21 33.7	9 29.2	-10 18.0	+0.7150	0.5449	+0.1046	+90	+14
108 Tauri	6½	0.29	2.1	22 9.6	12 57.3	- 6 57.6	+0.4164	0.5459	0.0980	+67	- 3
n Tauri	5½	0.27	2.1	21 59.0	14 43.0	- 5 14.9	+0.7796	0.5468	0.0942	+90	+19
121 Tauri	6	0.20	1.4	23 57.9	22 6.7	+ 1 54.2	-0.7464	0.5475	0.0794	- 3	-66
B. A. C. 1801	6	0.20	1.8	23 9.2	10 1 44.6	+ 5 24.8	+0.4151	0.5483	0.0714	+68	+ 1
132 Tauri	5½	+0.18	+ 1.8	+24 31.8	4 19.2	+ 7 54.1	-0.9160	0.5479	+0.0665	-14	-65
1 Geminorum	5	0.11	1.6	23 16.1	11 15.7	- 9 23.3	+0.8756	0.5485	0.0516	+90	+29
2 Geminorum	7	0.10	1.5	23 38.8	12 29.1	- 8 12.4	+0.5193	0.5493	0.0482	+76	+ 9
3 Geminorum	6½	0.09	1.6	23 7.8	13 49.9	- 6 54.4	+1.1540	0.5493	0.0456	+90	+50
5 Geminorum	6½	0.06	1.3	24 26.6	14 37.6	- 6 8.3	-0.2569	0.5491	0.0438	+26	-33
9 Geminorum	6½	+0.06	+ 1.4	+23 46.7	17 7.8	- 3 43.2	+0.5781	0.5490	+0.0387	+82	+12
ε Geminorum	3½	-0.02	1.2	25 14.4	11 5 25.0	+ 8 9.1	-0.7237	0.5491	0.0112	- 2	-65
37 Geminorum	6½	0.06	1.1	25 30.7	10 37.5	-10 48.8	-0.9926	0.5488	+0.0002	-21	-64
ω Geminorum	5½	0.08	1.3	24 22.2	13 54.2	- 7 38.8	+0.2583	0.5490	-0.0068	+56	- 2
48 Geminorum	6	0.10	1.3	24 18.8	18 30.7	- 3 11.6	+0.2675	0.5484	0.0171	+57	- 2
52 Geminorum	6½	-0.12	+ 1.2	+25 4.5	19 31.7	- 2 12.6	-0.5960	0.5482	-0.0194	+ 6	-53
A Geminorum	5½	0.16	1.2	25 15.6	23 34.5	+ 1 42.0	-0.8966	0.5480	0.0281	-13	-65
κ Geminor. *mult*	3½	0.18	1.4	24 39.7	12 9 17.7	+11 5.8	-0.6045	0.5457	0.0478	+ 6	-57
82 Geminorum	6½	0.20	1.5	23 24.7	11 14.0	-11 1.8	+0.6871	0.5459	0.0522	+90	+17
μ^1 Cancri	6½	0.20	1.9	22 57.0	19 32.4	- 2 59.8	+0.6908	0.5435	0.0701	+90	+16
γ Cancri	4½	-0.28	+ 2.0	+21 51.9	13 13 7.0	- 9 59.4	+0.3674	0.5384	-0.1039	+64	- 6
				NEW	*MOON.*						
ι Leonis *mult.*	4	0.16	2.4	11 8.1	16 22 55.6	- 2 38.6	-1.2930	0.5090	0.2128	-41	-79
ω Virginis	6	0.13	2.0	8 44.6	17 6 45.1	+ 4 57.5	-0.3364	0.5076	0.2182	+23	-58
ξ Virginis	5½	-0.11	+ 2.1	+ 8 52.2	10 25.7	+ 8 31.9	-1.2830	0.5063	-0.2204	-39	-81
ν Virginis	4	0.11	1.8	7 8.8	10 44.7	+ 8 50.4	+0.5450	0.5064	0.2206	+75	-11
π Virginis	4½	0.06	1.7	7 13.6	18 51.5	- 7 16.5	-1.3460	0.5058	0.2248	-49	-83
c Virginis	5½	-0.02	1.1	3 55.5	18 5 25.6	+ 2 59.7	-0.1244	0.5056	0.2294	+34	-46
B. A. C. 4254	6	+0.05	+ 0.9	+ 2 27.7	15 10.2	-11 32.1	-0.7669	0.5052	0.2315	0	-78
65 Virginis	6	+0.22	- 0.2	- 4 20.9	19 15 14.4	+11 51.3	+1.0470	0.5091	-0.2318	+86	+18
80 Virginis	6	0.28	1.4	4 50.1	21 41.1	- 5 53.2	+0.0829	0.5118	0.2306	+44	-36
88 Virginis	6½	0.33	1.5	6 17.4	20 4 21.8	+ 0 35.9	+0.1203	0.5138	0.2284	+46	-34
B. A. C. 4647	6½	0.36	1.9	7 31.1	7 49.4	+ 3 57.4	+0.6540	0.5150	0.2269	+81	- 6
94 Virginis	6½	0.39	2.1	8 22.1	13 38.2	+ 9 35.9	+0.2540	0.5177	0.2242	+53	-27
95 Virginis	6	+0.39	- 2.3	- 8 47.4	13 51.3	+ 9 48.6	+0.6572	0.5170	-0.2238	+80	- 6
κ Virginis	4½	+0.46	- 2.5	- 9 45.8	16 59.4	-11 8.9	+1.0000	0.5194	-0.2223	+80	+15

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

The Star's					At Conjunction in R. A.					Limiting Parallels	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δa	Δδ								
		s	″	° ′	d h m	h m				°	°
o^1 Libræ	6½	+0.86	- 3.9	-15 9.1	**22** 2 14.3	- 2 56.4	-0.2352	0.5407	-0.1927	+22	-55
o^2 Libræ	6½	0.85	3.5	14 44.6	3 11.1	- 2 1.5	-0.8492	0.5420	0.1916	-12	-90
ζ^1 Libræ	6	0.89	4.1	16 20.0	5 35.5	+ 0 18.1	+0.3678	0.5435	0.1881	+53	-21
ζ^2 Libræ	7	0.90	4.5	17 3.8	6 11.8	+ 0 53.2	+1.0190	0.5434	0.1865	+73	+18
ζ^3 Libræ	6	0.99	4.5	16 13.9	6 42.7	+ 1 23.1	+0.0542	0.5439	0.1865	+36	-38
ζ^4 Libræ	5½	+0.93	- 4.0	-16 28.8	7 44.8	+ 2 23.2	+0.1206	0.5448	-0.1854	+40	-34
47 Libræ	6½	1.07	4.7	19 3.5	17 43.8	-11 58.1	+1.0350	0.5531	0.1707	+71	+20
β^1 Scorpii	2	1.14	4.6	19 30.3	22 21.4	- 7 30.1	+0.7226	0.5568	0.1636	+70	0
β^2 Scorpii	5½	1.14	4.6	19 30.1	22 21.4	- 7 30.1	+0.7191	0.5568	0.1636	+70	0
ν^2 Scorpii	4½	1.17	4.3	19 10.6	**23** 1 14.5	- 4 43.2	-0.0830	0.5593	0.1589	+25	-45
ψ Ophiuchi	4½	+1.25	- 4.2	-19 46.9	6 28.9	+ 0 20.0	-0.2603	0.5637	-0.1485	+15	-56
ω Ophiuchi	4½	1.31	4.4	21 13.9	9 53.4	+ 3 37.2	+0.7418	0.5668	0.1426	+68	+ 1
b Ophiuchi *var.*	5	1.68	3.8	24 4.5	**24** 8 11.3	+ 1 4.6	+0.9982	0.5857	0.0937	+66	+20
c^2 Ophiuchi	5	1.70	3.6	23 52.7	10 12.3	+ 3 1.0	+0.6146	0.5882	0.0890	+59	- 6
63 Ophiuchi	6½	1.85	2.8	24 51.9	19 25.3	+11 52.1	+0.9038	0.5939	0.0640	+65	+13
4 Sagittarii	5½	+1.87	- 2.4	-23 48.3	21 20.5	-10 17.4	-0.2867	0.5957	-0.0599	+ 5	-58
7 Sagittarii	6	1.89	2.3	24 16.8	22 31.0	- 9 9.7	+0.1263	0.5956	0.0557	+26	-33
P. xvii, 330	5½	1.88	1.9	23 8.4	22 50.5	- 8 51.0	-1.0435	0.5961	0.0555	-40	-90
9 Sagittarii	6	1.92	2.3	24 21.8	22 54.7	- 8 47.0	+0.1868	0.5961	0.0555	+29	-30
B. A. C. 6161	5½	1.91	1.7	23 43.5	**25** 1 56.8	- 5 52.2	-0.6134	0.5980	0.0470	-14	-88
λ Sagittarii	3	+2.04	- 1.5	-25 28.9	8 7.3	+ 0 3.1	+0.9212	0.6018	-0.0298	+65	+15
24 Sagittarii	6	2.06	0.8	24 6.8	10 23.6	+ 2 13.7	-0.5134	0.6029	0.0222	-11	-76
25 Sagittarii	6½	2.06	0.9	24 18.3	10 38.3	+ 2 27.9	-0.3260	0.6029	0.0219	- 2	-61
B. A. C. 6343	6½	2.06	0.4	23 35.9	12 9.0	+ 3 54.8	-1.0650	0.6038	0.0182	-45	-90
26 Sagittarii	6½	2.08	- 0.3	23 56.1	13 24.3	+ 5 6.9	-0.7462	0.6034	-0.0135	-25	-90
ψ Sagittarii	5½	+2.25	+ 0.9	-25 26.7	**26** 1 59.7	- 6 49.2	+0.8158	0.6081	+0.0199	+65	+ 7
χ^1 Sagittarii	5½	2.28	1.7	24 43.3	5 37.9	- 3 20.1	+0.1986	0.6084	0.0343	+29	-29
χ^2 Sagittarii	6½	2.28	1.7	24 37.6	5 40.4	- 3 17.7	+0.1059	0.6084	0.0343	+23	-34
χ^3 Sagittarii	5½	2.27	1.9	24 10.7	5 43.7	- 3 14.5	-0.3378	0.6084	0.0344	0	-62
h^1 Sagittarii	6	2.33	2.2	24 57.6	9 37.7	+ 0 29.6	+0.5933	0.6089	0.0462	+55	- 7
h^2 Sagittarii	4½	+2.33	+ 2.2	-25 7.5	9 52.5	+ 0 43.9	+0.7684	0.6088	+0.0466	+65	+ 5
53 Sagittarii	6½	2.32	2.8	23 40.6	11 3.7	+ 1 51.9	-0.6081	0.6092	0.0499	-14	-86
B. A. C. 6727	6	2.32	2.8	23 40.8	11 10.2	+ 1 58.1	-0.5999	0.6092	0.0499	-13	-85
17 Capricorni	6	2.49	6.9	21 54.7	**27** 11 51.4	+ 1 37.1	-0.2049	0.6059	0.1213	+14	-53
η Capricorni	5	2.49	8.1	20 17.3	18 47.5	+ 8 16.0	-0.8952	0.6027	0.1394	-22	-90
χ Capricorni	5½	+2.51	+ 8.2	-21 38.0	20 21.2	+ 9 45.8	+0.6480	0.6031	+0.1428	+66	- 4
27 Capricorni	6½	2.50	8.5	20 59.7	20 44.1	+10 7.7	+0.0720	0.6023	0.1445	+31	-36
φ Capricorni	5½	2.51	8.6	21 6.4	23 3.9	-11 38.2	+0.5246	0.5999	0.1497	+58	-12
33 Capricorni	5½	2.53	9.0	21 19.1	**28** 2 20.6	- 8 29.4	+1.2390	0.5990	0.1574	+69	+42
37 Capricorni	6	2.52	9.7	20 34.3	6 29.4	- 4 30.8	+1.1810	0.5969	0.1680	+69	+34
ε Capricorni	4½	+2.52	+ 9.9	-19 57.3	7 21.6	- 3 40.6	+0.7223	0.5967	+0.1689	+70	0
κ Capricorni	5	2.52	10.2	19 21.8	9 32.1	- 1 35.4	+0.5163	0.5957	0.1747	+60	-12
B. A. C. 7550	6½	2.52	10.2	20 7.2	9 45.2	- 1 22.8	+1.2960	0.5953	0.1749	+70	+51
29 Aquarii *mult.*	6½	2.49	11.4	17 29.4	17 20.8	+ 5 54.7	+0.1062	0.5909	0.1901	+37	-35
56 Aquarii	6½	2.45	12.8	15 8.6	**29** 4 33.6	- 7 18.6	+0.0572	0.5829	0 2107	+37	-37
τ^1 Aquarii *mult.*	5½	+2.43	+13.6	-14 37.9	11 41.7	- 0 26.9	+1.0980	0 5790	+0.2214	+75	+23
τ^2 Aquarii	4	2.42	13.6	14 10.2	12 29.6	+ 0 19.3	+0.8200	0.5780	0.2226	+76	+ 4
74 Aquarii	6	2.40	13.7	12 11.9	14 6.8	+ 1 52.8	-0.7529	0.5771	0.2244	- 5	-90
ψ^1 Aquarii	4	2.35	15.2	9 41.0	23 30.8	+10 56.0	-1.0610	0.5706	0.2356	-22	-90
ψ^2 Aquarii	4	2.34	15.2	9 46.8	**30** 0 23.2	+11 46.4	-0.7590	0.5703	0.2361	- 3	-90
ψ^3 Aquarii	4½	+2.38	+15.0	-10 12.5	0 50.0	-11 47.7	-0.2311	0.5698	+0.2368	+25	-54
B. A. C. 8274	7	2.29	14.9	6 59.3	13 35.2	+ 0 29.9	-0.3201	0.5635	0.2475	+22	-59
30 Piscium	4½	2.25	15.0	6 37.4	19 28.2	+ 6 10.5	+0.7832	0.5598	0.2505	+74	+ 1
33 Piscium	5	2.24	14.9	6 19.2	20 57.9	+ 7 37.0	+0.8576	0.5589	0.2508	+84	+ 6
B. A. C. 17	6	2.23	14.9	5 51.3	23 10.0	+ 9 44.5	+0.9504	0.5585	0.2518	+84	+12
14 Ceti	6	+2.15	+14.9	- 1 6.4	**31** 10 27.3	- 3 21.6	-0.9183	0.5522	+0.2539	-10	-90
15 Ceti	6½	+2.15	+14.9	- 1 6.3	11 36.4	- 2 14.9	-0.6288	0.5514	+0.2537	+ 8	-82

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
26 Ceti	6	+2.07	+14.7	+ 0 46.9	31 23 19.5	+ 9 4.4	+0.4505	0.5474	+0.2522	+68	-17
SEPTEMBER.											
29 Ceti	6½	+2.07	+14.6	+ 1 25.4	1 1 14.4	+10 55.6	+0.2886	0.5470	+0.2519	+57	-25
33 Ceti	6	+2.06	+14.4	+ 1 52.0	2 25.5	-11 55.8	+0.1376	0.5462	+0.2512	+48	-33
35 Ceti	6½	2.05	14.6	1 53.7	3 20.0	-11 3.1	+0.3378	0.5466	0.2513	+60	-23
f Piscium	5	2.03	14.2	3 2.4	5 45.4	- 8 42.5	-0.2087	0.5460	0.2515	+30	-52
ν Piscium	4½	1.95	13.9	4 56.0	16 42.0	+ 1 52.3	+0.5813	0.5438	0.2441	+78	- 9
64 Ceti	5½	1.87	12.7	8 3.5	2 6 38.5	- 8 38.7	+0.7259	0.5419	0.2330	+90	0
ξ^1 Ceti	4½	+1.85	+12.6	+ 8 20.0	7 24.1	- 7 54.7	+0.6198	0.5416	+0.2322	+82	- 6
ξ Arietis	5½	1.82	11.8	10 6.9	12 54.7	- 2 34.9	+0.0550	0.5412	0.2268	+44	-35
B. A. C. 755	6½	1.81	11.8	10 4.3	13 49.1	- 1 42.3	+0.3024	0.5408	0.2256	+58	-22
31 Arietis	5½	1.78	11.0	11 58.5	18 24.1	+ 2 43.7	-0.6408	0.5418	0.2208	+ 6	-76
38 Arietis	5	1.74	10.9	11 59.2	22 18.4	+ 6 30.3	+0.2006	0.5413	0.2174	+52	-26
B. A. C. 1119	6	+1.54	+ 9.3	+16 10.8	3 23 38.5	+ 7 0.2	+0.8574	0.5430	+0.1800	+90	+14
B. A. C. 1206	6	1.50	7.8	17 0.0	4 5 59.2	-10 51.6	+1.1040	0.5437	0.1696	+90	+33
B. A. C. 1240	6	1.48	7.1	17 53.1	9 30.4	- 7 27.5	+0.7521	0.5440	0.1630	+90	+10
ω^1 Tauri	6	1.45	6.5	19 19.1	13 19.9	- 3 45.6	-0.1596	0.5443	0.1569	+32	-40
ω^2 Tauri	5½	1.41	6.0	20 18.5	17 2.9	- 0 10.0	-0.6442	0.5452	0.1502	+ 5	-67
NEPTUNE				+19 51.3	21 45.0	+ 4 22.5	+0.5223	0.5455	+0.1412	+75	- 2
B. A. C. 1373	6	+1.36	+ 5.4	21 22.5	21 57.4	+ 4 34.6	-1.0750	0.5453	0.1408	-25	-69
W. iv, 650	6	1.33	5.3	20 27.9	5 2 40.7	+ 9 8.3	+0.5439	0.5465	0.1316	+78	+ 2
ι Tauri	5	1.20	4.5	21 26.0	13 59.5	- 3 55.7	+0.8704	0.5475	0.1093	+90	+23
105 Tauri	6	1.18	4.2	21 33.7	16 11.3	- 1 48.3	+0.9674	0.5482	0.1046	+90	+29
108 Tauri	6½	+1.15	+ 3.8	+22 9.7	19 36.4	+ 1 29.8	+0.6661	0.5489	+0.0976	+90	+12
π Tauri	5½	1.12	3.6	21 59.1	21 20.6	+ 3 10.4	+1.0230	0.5484	0.0940	+90	+34
121 Tauri	6	1.09	2.9	23 57.9	6 4 38.5	+10 13.5	-0.4945	0.5493	0.0785	+13	-51
B. A. C. 1801	6	1.03	2.8	23 9.2	8 14.0	-10 18.3	+0.6589	0.5494	0.0711	+90	+14
132 Tauri	5½	1.02	2.6	24 31.8	10 46.7	- 7 50.9	-0.6691	0.5499	0.0654	+ 2	-62
1 Geminorum	5	+0.92	+ 2.3	+23 16.1	17 39.2	- 1 12.3	+1.1060	0.5495	+0.0503	+90	+45
2 Geminorum	7	0.91	2.1	23 38.8	18 51.9	- 0 2.1	+0.7537	0.5500	0.0476	+90	+22
5 Geminorum	6½	0.96	1.8	24 26.6	20 59.3	+ 2 0.9	-0.0220	0.5498	0.0431	+39	-20
9 Geminorum	6½	0.86	1.9	23 46.7	23 28.3	+ 4 24.8	+0.8066	0.5499	0.0374	+90	+25
ε Geminorum	3½	0.76	1.0	25 14.4	7 11 40.9	- 7 47.5	-0.5047	0.5493	+0.0105	+14	-52
37 Geminorum	6½	+0.70	+ 0.9	+25 30.7	16 51.8	- 2 47.1	-0.7812	0.5490	-0.0009	- 5	-64
ω Geminorum	5½	0.64	0.8	24 22.2	20 7.8	+ 0 22.3	+0.4633	0.5481	0.0081	+72	+10
48 Geminorum	6	0.65	0.6	24 18.8	8 0 43.2	+ 4 48.4	+0.4642	0.5479	0.0182	+72	+ 9
52 Geminorum	6½	0.63	0.3	25 4.5	1 44.1	+ 5 47.2	-0.3960	0.5478	0.0205	+18	-39
A Geminorum	5½	0.58	+ 0.1	25 15.6	5 46.5	+ 9 41.5	-0.6998	0.5465	0.0292	0	-63
κ Geminor. *mult.*	4	+0.48	0.0	+24 39.7	15 28.8	- 4 55.6	-0.4244	0.5441	-0.0501	+17	-44
82 Geminorum	6½	0.45	+ 0.4	23 24.7	17 24.9	- 3 3.4	+0.8598	0.5434	0.0541	+90	+27
μ^1 Cancri	6½	0.40	+ 0.3	22 57.0	9 1 43.2	+ 4 58.5	+0.8523	0.5420	0.0713	+90	+25
λ Cancri	5½	0.34	- 0.2	24 22.1	8 24.2	+11 26.4	-1.2430	0.5398	0.0845	-47	-66
γ Cancri	4½	0.34	+ 0.1	21 51.9	19 18.2	- 2 0.7	+0.4982	0.5368	0.1056	+74	+ 2
B. A. C. 3138	6½	+0.16	0.0	+21 44.2	10 10 1.1	-11 45.8	-1.1080	0.5311	-0.1319	-28	-68
B. A. C. 3206	6½	0.11	+ 0.2	20 15.8	15 32.1	- 6 25.2	-0.2241	0.5292	0.1409	+28	-41
η Leonis	3½	+0.02	+ 0.4	+17 17.9	11 12 57.2	- 9 39.3	-0.3032	0.5212	0.1731	+24	-49
				NEW	*MOON.*						
65 Virginis	6	+0.02	- 0.4	- 4 20.9	15 20 56.5	- 4 39.2	+0.8572	0.5117	-0.2350	+86	+ 5
66 Virginis	6	0.03	0.5	4 35.3	21 35.0	- 4 1.8	+0.9674	0.5118	0.2348	+86	+12
l^2 Virginis	5	0.04	0.6	5 41.3	16 1 29.4	- 0 14.2	+1.2400	0.5130	0.2338	+84	+34
80 Virginis	6	0.05	0.6	4 50.1	3 21.5	+ 1 34.6	-0.1205	0.5128	0.2330	+33	-47
88 Virginis	6½	0.08	0.9	6 17.3	10 0.5	+ 8 2.0	-0.0969	0.5153	0.2310	+34	-46
B. A. C. 4647	6½	+0.10	- 1.1	- 7 31.0	13 27.4	+11 22.8	+0.4327	0.5172	-0.2292	+65	-18
94 Virginis	6½	+0.14	- 1.3	- 8 22.0	19 15.4	- 6 59.6	+0.0233	0.5184	-0.2263	+40	-39

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
95 Virginis	6	+0.13	− 1.4	− 8 47.3	**16** 19 28.3	− 6 47.0	+0.4293	0.5187	−0.2261	+64	−18
κ Virginis	4½	0.17	1.6	9 45.7	22 36.1	− 3 44.8	+0.7674	0.5207	0.2245	+76	0
2 Libræ	6½	0.19	1.9	11 12.7	**17** 3 54.6	+ 1 24.1	+1.1360	0.5225	0.2207	+79	+25
μ Libræ	5½	0.31	2.8	13 41.4	16 43.5	−10 10.7	+1.0140	0.5299	0.2102	+76	+17
o^1 Libræ	6½	0.45	3.0	15 9.1	**18** 7 56.0	+ 4 32.7	−0.5025	0.5393	0.1930	+ 8	−73
o^2 Libræ	6½	+0.46	− 2.7	−14 44.6	8 53.2	+ 5 28.0	−1.1190	0.5402	−0.1917	−31	−90
ζ^1 Libræ	6	0.49	3.2	16 20.0	11 18.6	+ 7 48.6	+0.1021	0.5412	0.1886	+39	−35
ζ^2 Libræ	7	0.49	3.5	17 3.8	11 55.3	+ 8 24 1	+0.7588	0.5420	0.1877	+70	+ 1
ζ^3 Libræ	6	0.50	3.6	16 13.9	12 26.4	+ 8 54.2	−0.2218	0.5425	0.1870	+22	−54
ζ^4 Libræ	5½	0.51	4.1	16 28.8	13 28.9	+ 9 54.7	−0.1320	0.5435	0.1858	+26	−49
47 Libræ	6½	+0.62	− 3.9	−19 3.5	23 34.1	− 4 20.4	+0.7652	0.5499	−0.1708	+71	+ 2
β^1 Scorpii	2	0.69	3.8	19 30.3	**19** 4 15.1	+ 0 11.0	+0.4544	0.5534	0.1628	+56	−16
β^2 Scorpii	5½	0.69	3.8	19 30.1	4 15.2	+ 0 11.0	+0.4510	0.5534	0.1628	+56	−16
ν^2 Scorpii	4½	0.73	3.8	19 10.6	7 10.7	+ 3 0.5	−0.3595	0.5567	0.1578	+11	−63
ψ Ophiuchi	4½	0.80	3.6	19 46.9	12 29.9	+ 8 8.5	−0.5383	0.5599	0.1483	+ 1	−77
ω Ophiuchi	4½	+0.86	− 3.9	−21 13.9	15 57.7	+11 28.9	+0.4730	0.5619	−0.1416	+55	−15
39 Ophiuchi	5½	1.11	4.1	24 10.0	**20** 11 17.5	+ 6 6.2	+1.1680	0 5764	0.1000	+66	+36
B. A. C. 5831	6½	1.15	4.0	23 57.2	11 19.9	+ 6 8.5	+0.9448	0.5764	0.1000	+66	+15
b Ophiuchi *var.*	5	1.20	4.0	24 4.5	14 43.5	+ 9 24.4	+0.7435	0.5786	0.0919	+66	+ 2
c^3 Ophiuchi	5	1.23	3 7	23 52.7	16 47.4	+11 23.6	+0.3522	0.5797	0.0870	+41	−21
63 Ophiuchi	6½	+1.38	− 3.3	−24 52.0	**21** 2 15.0	− 3 30.6	+0.6580	0.5844	−0.0632	+61	− 3
4 Sagittarii	5½	1.40	2.8	23 48.4	4 13.5	− 1 36.8	−0.5503	0.5861	0.0582	−10	−80
7 Sagittarii	6	1 42	2.7	24 16.8	5 25.9	− 0 27.2	−0.1316	0.5872	0.0548	+12	−49
9 Sagittarii	6	1.43	2.8	24 21.8	5 50.2	− 0 3.8	−0.0684	0.5875	0.0540	+16	−45
B. A. C. 6161	5½	1.47	2.2	23 43.5	8 57.6	+ 2 56.2	−0.8788	0.5888	0.0455	−29	−90
λ Sagittarii	3	+1.60	− 2.3	−25 28.9	15 19.2	+ 9 2.6	+0.6836	0.5913	−0.0281	+61	− 1
24 Sagittarii	6	1.62	1.6	24 6.8	17 39.6	+11 17.4	−0.7707	0.5920	0.0216	−25	−90
25 Sagittarii	6½	1.62	1.7	24 18.3	17 54.7	+11 31.9	−0.5807	0.5921	0.0210	−15	−83
26 Sagittarii	6½	1.66	1.1	23 56.1	20 45.9	− 9 43.8	−1.0035	0.5929	0.0127	−41	−90
B. A. C. 6369	6	1.69	1.5	25 7.2	21 53.9	− 8 38.5	+0.1899	0.5936	−0.0098	+25	−30
ψ Sagittarii	5½	+1.84	− 0.3	−25 26.7	**22** 9 45.8	+ 2 44.6	+0.6003	0.5969	+0.0239	+54	− 6
χ^1 Sagittarii	5½	1.88	+ 0.4	24 43.3	13 31.4	+ 6 21.1	−0.0219	0 5971	0.0347	+16	−42
χ^2 Sagittarii	6½	1.88	0.4	24 37.6	13 33.9	+ 6 23.5	−0.1161	0.5971	0.0347	+11	−48
χ^3 Sagittarii	5½	1.88	0.6	24 10.7	13 37.3	+ 6 26.8	−0.5672	0.5971	0.0350	−12	−81
h^1 Sagittarii	6	1.95	0.8	24 57.6	17 39.3	+10 18.9	+0.3849	0.5977	0.0465	+40	−19
h^2 Sagittarii	4½	+1.96	+ 0.8	−25 7.5	17 54.7	+10 33.7	+0.5646	0.5977	+0.0470	+54	− 9
53 Sagittarii	6½	1.92	1.4	23 40 6	19 8.2	+11 44.2	−0.8369	0.5981	0.0505	−26	−90
B. A. C. 6727	6	1.95	1.5	23 40.8	19 15.0	+11 50.7	−0.8268	0.5981	0.0510	−26	−90
17 Capricorni	6	2.26	5.3	21 54.7	**23** 20 46.3	−11 40.1	−0.3844	0.5946	0.1212	+ 6	−65
η Capricorni	5	2.30	6.6	20 17.3	**24** 3 55.7	− 4 47.8	−1.0720	0.5920	0.1390	−34	−90
χ Capricorni	5½	+2.34	+ 6.5	−21 38.0	5 32.6	− 3 14.9	+0.4975	0.5907	+0.1428	+56	−13
27 Capricorni	6½	2.33	6.8	20 59.7	5 56.1	− 2 52.3	−0.0812	0.5907	0.1436	+23	−46
φ Capricorni	5½	2.36	7.0	21 6.4	8 20.3	− 0 33.8	+0.3815	0.5903	0.1471	+48	−20
33 Capricorni	5½	2.36	7.4	21 19.1	11 43.0	+ 2 41.0	+1.1111	0.5882	0.1575	+69	+27
37 Capricorni	6	2.41	8.1	20 34.4	15 59.2	+ 6 47.0	+1.0630	0.5872	0.1671	+69	+23
ε Capricorni	4½	+2.41	+ 8.4	−19 57.4	16 53.0	+ 7 38.8	+0.6011	0.5869	+0.1692	+65	− 8
κ Capricorni	5	2.43	8.8	19 21.9	19 7.2	+ 9 47.8	+0.3974	0.5861	0.1739	+53	−19
B. A C. 7550	6½	2.43	8.7	20 7.3	19 20.6	+10 0.6	+1.1875	0.5862	0.1744	+70	+34
29 Aquarii *mult.*	6½	2.45	10.1	17 29.4	**25** 3 8.7	− 6 29.3	−0.0017	0.5820	0.1901	+32	−41
56 Aquarii	6½	2.47	12.0	15 8.6	14 37.8	+ 4 33.7	−0.0214	0.5764	0.2106	+33	−42
τ^1 Aquarii *mult.*	5½	+2.50	+12.8	−14 37.9	21 55.6	+11 35.1	+1.0510	0.5722	+0.2216	+75	+19
τ^2 Aquarii	4	2.50	13.0	14 10.2	22 43.8	−11 38.4	+0.7705	0.5722	0.2227	+71	+ 1
74 Aquarii	6	2.48	13.2	12 11.9	**26** 0 22.8	−10 3.0	−0.8117	0.5711	0.2249	− 8	−90
ψ^1 Aquarii	4	2.47	14.3	9 41.0	9 56.0	− 0 50.7	−1.0940	0.5661	0.2364	−25	−90
ψ^2 Aquarii	4	2.49	14.4	9 46.8	10 49.0	+ 0 0.4	−0.7903	0.5657	0.2375	− 5	−90
ψ^3 Aquarii	4½	+2.49	+14.5	−10 12.5	11 16.0	+ 0 26.5	−0.2590	0.5657	+0.2378	+24	−56
30 Piscium	4½	+2.50	+15.8	− 6 37.3	**27** 6 5.0	− 5 24.6	+0.8162	0.5580	+0.2523	+83	+ 3

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"	° ′	d h m	h m				°	°
33 Piscium	5	+2.50	+15.9	- 6 19.1	**27** 7 35.1	- 3 57.6	+0.8939	0.5575	+0.2530	+84	+ 8
B. A. C. 17	6	2.54	16.0	- 5 51.2	9 47.8	- 1 49.5	+0.9933	0.5573	0.2543	+84	+14
26 Ceti	6	2.45	16.4	+ 0 46.9	**28** 9 54.6	- 2 32.3	+0.5585	0.5502	0.2564	+76	-11
29 Ceti	6½	2.44	16.5	1 25.4	11 48.7	- 0 42.0	+0.4014	0.5494	0.2555	+65	-20
33 Ceti	6	2.45	16.3	1 52.0	12 59.2	+ 0 26.1	+0.2575	0.5489	0.2552	+55	-27
35 Ceti	6½	+2.44	+16.4	+ 1 53.7	13 53.1	+ 1 18.2	+0.4589	0.5495	+0.2552	+69	-16
f Piscium	5	2.44	16.3	3 2.4	16 17.4	+ 3 37.7	-0.0787	0.5484	0.2540	+37	-44
μ Piscium	5	2.44	16.6	5 34.9	21 55.2	+ 9 4.1	-1.2150	0.5484	0.2516	-31	-84
ν Piscium	4½	2.42	16.1	4 56.1	**29** 3 6.0	- 9 55.6	+0.7304	0.5476	0.2483	+90	+ 2
64 Ceti	5½	2.39	15.2	8 3.5	16 49.0	+ 3 19.9	+0.9082	0.5471	0.2375	+90	+11
ξ¹ Ceti	4½	+2.45	+15.1	+ 8 20.0	17 33.8	+ 4 3.1	+0.8029	0.5468	+0.2368	+90	+ 5
ξ Arietis	5½	2.40	14.5	10 6.9	22 57.8	+ 9 16.3	+0.2521	0.5474	0.2314	+55	-25
B. A. C. 755	6½	2.40	14.5	10 4.3	23 51.3	+10 7.9	+0.5034	0.5476	0.2305	+72	-12
31 Arietis	5½	2.41	13.9	11 58.5	**30** 4 20.3	- 9 32.0	-0.4256	0.5475	0.2251	+18	-62
38 Arietis	5	+2.38	+13.7	+11 59.2	8 9.6	- 5 50.5	+0.4109	0.5474	+0.2204	+66	-15

OCTOBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
B. A. C. 1119	6	+2.29	+10.9	+16 10.9	**1** 8 53.2	- 5 57.0	+1.1030	0.5505	+0.1840	+90	+31
B. A. C. 1240	6	2.24	9.5	17 53.2	18 29.8	+ 3 19.9	+1.0090	0.5517	0.1669	+90	+25
B. A. C. 1242	6½	+2.26	+ 9.0	+19 53.6	18 36.0	+ 3 25.9	-1.0850	0.5517	+0.1665	-24	-70
ω¹ Tauri	6	2.23	8.8	19 19.2	22 13.6	+ 6 56.0	+0.1088	0.5520	0.1597	+48	-24
ω² Tauri	5½	2.23	8.3	20 18.6	**2** 1 50.8	+10 25.8	-0.3714	0.5526	0.1529	+20	-50
53 Tauri	6	2.23	8.0	20 52.7	2 48.2	+11 21.2	-0.8239	0.5524	0.1509	- 6	-69
NEPTUNE				19 48.5	6 9.5	- 9 24.5	+0.8005	0.5530	0.1446	+90	+15
B. A. C. 1373	6	+2.20	+ 7.5	+21 22.5	6 37.8	- 8 57.1	-0.7885	0.5526	+0.1434	+ 4	-69
W. iv, 650	6	2.14	7.2	20 27.9	11 14.0	- 4 30.5	+0.8141	0.5534	0.1342	+90	+16
ι Tauri	5	2.03	6.0	21 26.0	22 16.2	+ 6 8.8	+1.1450	0.5550	0.1111	+90	+43
108 Tauri	6½	1.93	5.1	22 9.7	**3** 3 45.3	+11 26.5	+0.9430	0.5546	0.0990	+90	+28
121 Tauri	6	1.96	3.6	23 57.9	12 35.4	- 4 1.8	-0.2029	0.5547	0.0796	+30	-33
B. A. C. 1801	6	+1.90	+ 3 6	+23 9.2	16 6.3	- 0 38.3	+0.9386	0.5545	+0.0716	+90	+31
132 Tauri	5½	1.90	3.2	24 31.8	18 36.0	+ 1 46.2	-0.3783	0.5547	0.0659	+19	-41
2 Geminorum	7	1.82	2.4	23 38.8	**4** 2 31.8	+ 9 25.5	+1.0330	0.5542	0.0479	+90	+40
5 Geminorum	6½	1.77	2.0	24 26.6	4 36.8	+11 26.1	+0.2626	0.5545	0.0430	+57	- 5
9 Geminorum	6½	1.77	1.8	23 46.7	7 3.2	-10 12.6	+1.0850	0.5545	0.0375	+90	+44
ε Geminorum	3½	+1.63	+ 0.4	+25 14.4	19 4.1	+ 1 23.4	-0.2204	0.5522	+0.0100	+28	-27
37 Geminorum	6½	1.57	- 0.3	25 30.7	**5** 0 10.7	+ 6 19.5	-0.4964	0.5512	-0.0016	+13	-44
ω Geminorum	5½	1.55	0.2	24 22.2	4 24.2	+10 26.5	+0.7295	0.5504	0.0110	+90	+23
48 Geminorum	6	1.48	0.6	24 18.8	7 56.6	-10 10.6	+0.7369	0.5493	0.0188	+90	+23
52 Geminorum	6½	1.49	0.9	25 4.5	8 56.8	- 9 12 4	-0.1190	0.5495	0.0213	+34	-23
A Geminorum	5½	+1.43	- 1.3	+25 15.6	12 56.4	- 5 21.0	-0.4232	0.5476	-0.0300	+17	-41
κ Geminor. *mult.*	3½	1.30	1.8	24 39.7	22 33.7	+ 3 56.9	-0.1581	0.5454	0.0509	+32	-28
82 Geminorum	6½	1.29	1.5	23 24.7	**6** 0 29.0	+ 5 48.3	+1.1210	0.5449	0.0551	+90	+46
μ¹ Cancri	6½	1.18	1.9	22 57.0	8 44.0	-10 13.1	+1.1070	0.5419	0.0721	+90	+43
λ Cancri	5½	1.11	2.8	24 22.1	15 22.9	- 3 47.4	-0.9891	0.5399	0.0859	-19	-66
γ Cancri	4½	+0.88	- 2.7	+21 51.9	**7** 2 14.8	+ 6 43.5	+0.7362	0 5352	-0.1067	+90	+14
B. A. C. 3138	6½	0.81	3.3	21 44.2	16 56.7	- 3 2.6	-0.8855	0.5292	0.1331	-10	-68
B. A. C. 3206	6½	0.74	3.0	20 15.8	22 27.5	+ 2 17.8	-0.0112	0.5272	0.1424	+40	-29
η Leonis	3½	0.54	2.8	17 17.9	**8** 19 53.7	- 0 55.2	-0.1255	0.5192	0.1742	+34	-39
42 Leonis	6	0.48	2.6	15 31.8	**9** 3 21.6	+ 6 19.3	+0.4937	0.5166	0.1837	+73	- 9
i Leonis	5½	+0.44	- 2.5	+14 42.0	8 43.8	+11 32.0	+0.4070	0.5153	-0.1903	+66	-14
k Leonis	5½	0.38	2.5	14 46.5	16 9.2	- 5 15.7	-1.1190	0.5129	0.1988	-25	-75
ι Leonis *mult.*	4	0.25	2.2	11 8.1	**10** 11 58.1	-10 1.1	-1.2380	0.5093	0.2176	-34	-79
ω Virginis	6	0.30	1.8	8 44.6	19 44.9	- 2 27.5	-0.3272	0.5084	0.2233	+24	-58
ξ Virginis	5½	0.19	1.8	8 52.2	23 23.2	+ 1 4.4	-1.2830	0.5063	0.2258	-39	-81
ν Virginis	4	+0.18	- 1.6	+ 7 8.8	23 42.0	+ 1 22.7	+0.5328	0.5080	-0.2259	+75	-12
c Virginis	5½	+0.11	- 1.4	+ 3 55.5	**11** 18 11.6	- 4 39.3	-0.2196	0.5078	-0.2350	+29	-53

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"	° '	d h m	h m				°	°
				NEW	MOON.						
κ Virginis	4½	+0.11	− 2.1	− 9 45.7	14 4 51.8	+ 4 18.4	+0.6465	0.5238	−0.2281	+78	− 7
μ Libræ	5½	0.13	2.2	13 41.5	22 44.2	− 2 22.6	+0.8604	0.5342	0.2138	+76	+ 6
o^1 Libræ	6½	0.21	2.4	15 9.1	15 13 44.5	−11 51.4	−0.6784	0.5440	0.1963	− 2	−90
o^2 Libræ	6½	+0.22	− 2.2	−14 44.6	14 40.9	−10 56.9	−1.2940	0.5450	−0.1953	−48	−90
ζ^1 Libræ	6	0.24	2.5	16 20.0	17 4.6	− 8 38.0	−0.0790	0.5460	0.1916	+23	−45
ζ^2 Libræ	7	0.24	2.7	17 3.8	17 40.7	− 8 3.1	+0.5737	0.5462	0.1909	+67	−10
ζ^3 Libræ	6	0.25	2 9	16 13.9	18 11.5	− 7 33.3	−0.4000	0.5468	0.1902	+13	−66
ζ^4 Libræ	5½	0.25	2.5	16 28 8	19 13.3	− 6 33.5	−0.3351	0.5474	0.1890	+16	−61
47 Libræ	6½	+0.33	− 3.0	−19 3.5	16 5 11.5	+ 3 4.4	+0.5689	0.5530	−0.1731	+64	−10
β^1 Scorpii	2	0.37	3.0	19 30.3	9 49.6	+ 7 32.9	+0.2496	0.5573	0.1654	+44	−27
β^2 Scorpii	5½	0.37	3.0	19 30.1	9 49.9	+ 7 33.2	+0.2460	0.5573	0.1654	+43	−27
ω^1 Scorpii	4½	0.38	3.2	20 22.3	10 25.0	+ 8 7.0	+1.0590	0.5573	0.1640	+70	+22
ω^2 Scorpii	4½	0.40	3.2	20 34.3	10 40.5	+ 8 21.9	+1.2260	0.5571	0.1638	+69	+39
ν^2 Scorpii	4½	+0.39	− 2.8	−19 10.6	12 43.5	+10 20.7	−0.5644	0.5588	−0.1603	0	−79
ψ Ophiuchi	4½	0.45	2.9	19 46.9	18 0.0	− 8 34.1	−0.7511	0.5624	0.1499	−11	−90
ω Ophiuchi	4½	0.49	3.2	21 13.9	21 26.2	− 5 15.2	+0.2573	0.5653	0.1434	+42	−27
22 Ophiuchi	6½	0.59	3.5	23 19.9	17 7 3.1	+ 4 0.7	+1.1550	0.5707	0.1232	+67	+33
39 Ophiuchi	5½	0.71	3.5	24 10.1	16 40.6	−10 43 4	+0.9395	0.5764	0.1008	+66	+15
B. A. C. 5831	6	+0.71	− 3.5	−23 57.1	16 43.1	−10 41.0	+0.7120	0.5764	−0.1008	+66	0
b Ophiuchi	5	0.76	3.4	24 4.4	20 6.5	− 7 25.3	+0.5103	0.5788	0.0913	+52	−12
c^2 Ophiuchi	5	0.78	3.3	23 52.6	22 10.4	− 5 26.1	+0.1190	0.5805	0.0874	+29	−34
63 Ophiuchi	6½	0.92	3.1	24 51.9	18 7 39.1	+ 3 40.8	+0.4209	0.5841	0.0635	+44	−17
4 Sagittarii	5½	0.94	2.7	23 48.3	9 38.0	+ 5 35.0	−0.7921	0.5852	0.0586	−23	−90
7 Sagittarii	6	+0.96	− 2.7	−24 16.8	10 50.8	+ 6 45.0	−0.3704	0.5852	−0.0552	0	−65
9 Sagittarii	6	0.97	2.7	24 21.8	11 15.2	+ 7 8.5	−0.3087	0.5852	0.0541	+ 4	−60
B. A. C. 6161	5½	0.95	2.3	23 43.5	14 23.7	+10 9.6	−1.1210	0 5871	0.0457	−46	−90
λ Sagittarii	3	1.11	2.5	25 28.9	20 48.1	− 7 41.2	+0.4469	0.5891	0.0285	+42	−16
24 Sagittarii	6	1.14	1.9	24 6.8	23 9.8	− 5 25.1	−1.0150	0.5891	0.0217	−41	−90
25 Sagittarii	6½	+1.14	− 1.9	−24 18.3	23 25.1	− 5 10.3	−0.8254	0.5894	−0.0208	−28	−90
B. A. C. 6369	6	1.20	1.9	25 7.2	19 3 26.7	− 1 18.4	−0.0512	0.5901	−0.0097	+12	−45
σ Sagittarii	2½	1.27	2.1	26 25.9	7 30.9	+ 2 36.2	+1.2760	0.5913	+0.0014	+64	+63
ψ Sagittarii	5½	1.38	1.1	25 26.7	15 28.3	+10 13.7	+0.3652	0.5932	0.0239	+37	−20
χ^1 Sagittarii	5½	1.33	0.5	24 43.3	19 17.6	−10 5.4	−0.2619	0.5920	0.0343	+ 4	−57
χ^2 Sagittarii	6½	+1.33	− 0.4	−24 37.6	19 20.2	−10 2.8	−0.3587	0.5920	+0.0347	+ 2	−64
χ^3 Sagittarii	5½	1.43	0.3	24 10.7	19 23.6	− 9 59.5	−0.8112	0.5920	0.0349	−26	−90
MARS				24 25.4	19 25.6	− 9 57.4	−0.6102	0.6121	0.0334	−15	−87
h^1 Sagittarii	6	1.50	0.2	24 57.6	23 30.0	− 6 3.0	+0.1511	0.5913	0.0464	+27	−32
h^2 Sagittarii	4½	1.51	− 0.2	25 7.5	23 45.6	− 5 48.0	+0.3310	0 5913	0.0470	+37	−22
53 Sagittarii	6½	+1.49	+ 0.3	−23 40.6	20 1 0.6	− 4 36.0	−1.0810	0.5915	+0.0504	−44	−90
B. A. C. 6727	6	1.49	0.4	23 40.8	1 7.5	− 4 29.4	−1.0730	0.5915	0.0509	−42	−90
17 Capricorni	6	1.84	3.5	21 54.7	21 3 15.5	− 3 23.4	−0.6123	0.5856	0.1200	− 8	−86
χ Capricorni	5½	1.96	4.7	21 38.0	12 17.1	+ 5 17.2	+0.2895	0.5817	0.1414	+43	−25
27 Capricorni	6½	1.94	4.9	20 59.7	12 41.4	+ 5 40.5	−0.2996	0.5816	0.1424	+11	−59
φ Capricorni	5½	+1.99	+ 5.0	−21 6.4	15 10.0	+ 8 3.5	+0.1751	0.5805	+0.1484	+37	−31
33 Capricorni	5½	2.03	5.4	21 19.1	18 38.9	+11 24.4	+0.9175	0.5785	0 1555	+69	+12
37 Capricorni	6	2.07	6.0	20 34.4	23 3.6	− 8 20.9	+0.8740	0.5777	0.1657	+69	+12
ε Capricorni	4½	2.08	6.4	19 57.4	23 58.9	− 7 27.7	+0.4067	0.5767	0.1677	+53	−16
κ Capricorni	5	2.09	6.6	19 21.9	22 2 17.4	− 5 14.4	+0.2033	0.5757	0.1723	+41	−27
B. A. C. 7550	6½	+2.10	+ 6.5	−20 7.3	2 31.3	− 5 1.1	+1.0070	0.5757	+0.1728	+70	+21
29 Aquarii *mult*	6½	2.16	8.1	17 29.4	10 34.8	+ 2 44.4	−0.1913	0.5712	0.1879	+23	−49
56 Aquarii	6½	2.25	10.2	15 8.6	22 27.0	− 9 49.4	−0.1926	0.5654	0.2082	+24	−49
τ^1 Aquarii *mult.*	5½	2.30	10.9	14 37.9	23 5 59.6	− 2 33.1	+0.9059	0.5616	0.2196	+75	+12
τ^2 Aquarii	4	2.31	11.1	14 10.2	6 49.1	− 1 45.3	+0.6248	0.5616	0.2206	+73	− 5
74 Aquarii	6	+2.31	+11.6	−12 11.9	8 31.5	− 0 6.6	−0.9781	0.5608	+0.2229	−18	−90
ψ^1 Aquarii	4	+2.37	+13.0	− 9 41.0	18 23.5	+ 9 24.7	−1.2470	0.5566	+0.2345	−38	−90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
ψ^2 Aquarii	4	+2.38	+13.1	− 9 46.8	**23** 19 18.3	+10 17.6	−0.9345	0.5566	+0.2353	−13	−90
ψ^3 Aquarii	4½	2.38	13.1	10 12.5	19 46.3	+10 44.6	−0.3951	0.5563	0.2360	+18	−62
30 Piscium	4½	2.49	14.8	6 37.4	**24** 15 8.9	+ 5 27.3	+0.4628	0.5493	0.2509	+68	−14
33 Piscium	5	2.50	15.0	6 19.2	16 41.4	+ 6 56.7	+0.8189	0.5499	0.2520	+84	+ 3
B. A. C. 17	6	2.51	15.2	5 51.3	18 57.8	+ 9 8.4	+0.9245	0.5491	0.2530	+84	+ 9
14 Ceti	6	+2.48	+16.2	− 1 6.4	**25** 6 32.5	− 3 40.2	−0.9057	0.5465	+0.2564	− 9	−90
15 Ceti	6½	2.55	16.2	− 1 6.4	7 43.0	− 2 32.1	−0.6050	0.5462	0.2564	+ 9	−80
26 Ceti	6	2.62	16.4	+ 0 46.8	19 36.7	+ 8 57.9	+0.5448	0.5453	0.2565	+75	−12
33 Ceti	6	2.63	16.6	1 51.9	22 44.3	+11 59.3	+0.2456	0.5448	0.2557	+55	−28
f Piscium	5	2.64	16.5	3 2.3	**26** 2 5.7	− 8 46.0	−0.0844	0.5450	0.2548	+36	−45
μ Piscium	5	+2.68	+17.2	+ 5 34.9	7 48.2	− 3 14.8	−1.2180	0.5452	+0.2520	−31	−84
ν Piscium	4½	2.68	16.5	4 56.1	13 2.6	+ 1 49.1	+0.7546	0.5445	0.2494	+90	0
64 Ceti	5½	2.74	16.0	8 3.6	**27** 2 51.6	− 8 49.4	+0.9607	0.5464	0.2395	+90	+14
ξ^1 Ceti	4½	2.74	16.0	8 20.1	3 36.7	− 8 5.9	+0.8602	0.5464	0.2388	+90	+ 8
ξ Arietis	5½	2.77	15.6	10 6.9	9 1.6	− 2 51.8	+0.3174	0.5474	0.2334	+58	−22
31 Arietis	5½	+2.80	+15.3	+11 58.5	14 24.5	+ 2 20.3	−0.3493	0.5483	+0.2278	+20	−57
38 Arietis	5	2.80	15.0	11 59.2	18 13.6	+ 6 1.7	+0.5025	0.5490	0.2238	+73	−11
B. A. C. 1119	6	2.85	12.4	16 10.9	**28** 18 47.8	+ 5 45.6	+1.2310	0.5540	0.1868	+90	+42
B. A. C. 1240	6	2.86	10.0	17 53.2	**29** 4 17.7	− 9 4.2	+1.1520	0.5564	0.1700	+90	+37
B. A. C. 1242	6½	2.82	10.7	19 53.6	4 23.9	− 8 58.2	−0.9319	0.5567	0.1694	−12	−70
ω^1 Tauri	6	+2.89	+10.4	+19 19.2	7 58.5	− 5 31.1	+0.2639	0.5569	+0.1629	+56	−16
ω^2 Tauri	5½	2.88	9.8	20 18.6	11 32.5	− 2 4.5	−0.2084	0.5576	0.1557	+30	−40
53 Tauri	6	2.85	9.6	20 52.7	12 29.1	− 1 9.8	−0.6584	0.5573	0.1537	+ 5	−67
NEPTUNE				19 42.5	14 50.8	+ 1 6.9	+0.9298	0.5590	0.1493	+90	+23
B. A. C. 1373	6	2.88	9.0	21 22.6	16 15.2	+ 2 28.3	−0.6193	0.5578	0.1462	+ 7	−64
W. iv, 650	6	+2.84	+ 8.5	+20 28.0	20 47.0	+ 6 50.5	+0.9824	0.5594	+0.1370	+90	+27
τ Tauri	4½	2.87	7.9	22 45.0	22 28.9	+ 8 28.9	−1.2000	0.5592	0.1329	−37	−67
108 Tauri	6½	2.79	5.9	22 9.7	**30** 13 0.7	− 1 30.1	+1.1300	0.5615	0.1013	+90	+42
121 Tauri	6	2.78	4.1	23 58.0	21 42.1	+ 6 52.8	−0.0036	0.5606	0.0814	+41	−22
B. A. C. 1801	6	2.72	3.9	23 9.3	**31** 1 7.7	+10 11.1	+1.1320	0.5606	0.0734	+90	+45
132 Tauri	5½	+2.77	+ 3.4	+24 31.9	3 34.6	−11 27.3	−0.1718	0.5608	+0.0674	+31	−30
5 Geminorum	6½	+2.62	+ 1.7	+24 26.6	13 24.3	− 1 58.5	+0.4748	0.5599	+0.0440	+73	+ 7
NOVEMBER.											
ε Geminorum	3½	+2.57	− 0.5	+25 14.4	**1** 3 35.7	+11 42.8	+0.0018	0.5571	+0.0105	+41	−15
37 Geminorum	6½	2.51	1.4	25 30.6	8 37.2	− 7 26.1	−0.2681	0.5555	−0.0007	+26	−29
39 Geminorum	6½	2.51	1.8	26 13.4	10 9.1	− 5 57.5	−1.0510	0.5558	0.0047	−25	−64
40 Geminorum	6½	2.50	1.8	26 3.7	10 26.8	− 5 40.5	−0.8766	0.5555	0.0054	−11	−64
ω Geminorum	5½	2.45	1.5	24 22.1	11 47.5	− 4 22.5	+0.9583	0.5549	0.0085	+90	+38
48 Geminorum	6	+2.40	− 2.2	+24 18.7	16 15.5	− 0 3.9	+0.9618	0.5536	−0.0189	+90	+37
52 Geminorum	6½	2.40	2.5	25 4.4	17 14.8	+ 0 53.4	+0.1091	0.5530	0.0213	+48	−11
A Geminorum	5½	2.35	3.0	25 15.5	21 11.0	+ 4 41.4	−0.1931	0.5520	0.0301	+30	−28
κ Geminor. *mult*	3½	2.25	4.1	24 39.6	**2** 6 40.3	−10 8.7	+0.0768	0.5484	0.0514	+46	−15
ω^2 Cancri	6½	2.15	5.2	25 23.4	14 33.9	− 2 31.1	−1.1990	0.5449	0.0680	−40	−65
λ Cancri	5½	+2.00	− 5.7	+24 22.0	23 18.5	+ 5 56.0	−0.7506	0.5408	−0.0858	− 2	−66
υ^2 Cancri	5½	2.00	6.3	24 30.5	**3** 3 5.6	+ 9 35.6	−1.2500	0.5398	0.0936	−48	−65
γ Cancri	4½	1.87	6.2	21 51.8	10 5.5	− 7 38.1	+0.9652	0.5358	0.1072	+90	+29
ξ Cancri	5	1.68	7.2	22 29.3	22 37.8	+ 4 30.1	−1.2133	0.5296	0.1297	−39	−68
79 Cancri	6½	1.70	7.2	22 26.4	23 6.8	+ 4 58.2	−1.2210	0.5294	0.1306	−40	−68
B. A. C. 3138	6½	+1.69	− 7.3	+21 44.1	**4** 0 43.4	+ 6 31.8	−0.6556	0.5284	−0.1332	+ 4	−65
B. A. C. 3206	6½	1.60	7.2	20 15.7	6 13.6	+11 51.6	+0.2140	0.5265	0.1427	+54	−18
η Leonis	3½	1.37	7.4	17 17.8	**5** 3 40.4	+ 8 39.2	+0.0867	0.5172	0.1744	+46	−28
42 Leonis	6	1.22	7.1	15 31.7	11 9.7	− 8 4.9	+0.6980	0.5144	0.1843	+90	+ 3
i Leonis	5½	1.15	7.3	14 41.9	16 32.9	− 2 51.2	+0.6078	0.5128	0.1905	+82	− 3
k Leonis	5½	+1.08	− 7.5	+14 46.4	**6** 0 0.3	+ 4 23.1	−0.9284	0.5098	−0.1987	−11	−75
ι Leonis *mult.*	4	+0.86	− 6.9	+11 8.0	19 56.0	− 0 15.5	−1.0700	0.5063	−0.2177	−20	−79

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination	Washington Mean Time.	Hour Angle H	Y	x′	y′	N	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
ω Virginis	6	+0.79	- 6.3	+ 8 44.5	**7** 3 45.0	+ 7 20.2	-0.1682	0.5054	-0.2237	+32	-48
ξ Virginis	5½	0.76	6.5	8 52.1	7 24.7	+10 53.7	-1.1300	0.5050	0.2259	-24	-81
ν Virginis	4	0.75	6.0	7 8.7	7 43.7	+11 12.2	+0.6861	0.5051	0.2261	+89	+ 4
π Virginis	4½	0.68	6.1	7 13.5	15 48.6	- 4 56.6	-1.2460	0.5047	0.2308	-34	-83
c Virginis	5½	0.61	5.3	3 55.4	**8** 2 18.1	+ 5 15.0	-0.0960	0.5052	0.2355	+36	-45
B. A. C. 4254	6	+0.54	- 5.1	+ 2 27.6	11 56.5	- 9 23.0	-0.7956	0.5075	-0.2391	- 1	-72
65 Virginis	6	0.49	3.9	- 4 21.0	**9** 11 38.0	-10 22.4	+0.8568	0.5142	0.2404	+86	+ 5
66 Virginis	6	0.39	3.9	4 35.4	12 16.0	- 9 45.5	+0.9623	0.5144	0.2404	+85	+11
l^2 Virginis	5	0.37	3.8	5 41.4	16 6.9	- 6 1.4	+1.2140	0.5165	0.2397	+84	+30
80 Virginis	6	0.37	3.9	4 50.2	17 57.0	- 4 14.6	-0.1390	0.5169	0.2391	+33	-49
88 Virginis	6½	+0.35	- 3.7	- 6 17.4	**10** 0 29.0	+ 2 5.8	-0.1406	0.5202	-0.2372	+33	-49
B. A. C 4647	6½	0.34	3.6	7 31.1	3 51.9	+ 5 22.6	+0.3688	0.5211	0.2355	+61	-22
κ Virginis	4½	0.31	3.3	9 45.8	12 48.8	- 9 56.9	+0.6625	0.5262	0.2310	+79	- 6
				NEW	*MOON.*						
β^1 Scorpii	2	+0.34	- 2.9	-19 30.3	**12** 16 55.8	- 7 34.2	+0.1796	0.5631	-0.1688	+40	-31
ψ Ophiuchi	4½	0.36	2.8	19 46.9	**13** 0 55.7	+ 0 9.2	-0.8224	0.5698	0.1536	-15	-90
ω Ophiuchi	4½	0.39	2.9	21 13.9	4 17.4	+ 3 23.5	+0.1739	0.5716	0.1468	+37	-31
39 Ophiuchi	5½	0.52	2.9	24 10.1	23 6.0	- 2 30.5	+0.8289	0.5840	0.1300	+66	+ 5
B. A. C. 5831	6½	0.53	2.9	23 57.2	23 8.4	- 2 28.2	+0.6033	0.5842	0.1029	+59	- 7
b Ophiuchi *var.*	5	+0.56	- 2.8	-24 4.5	**14** 2 27.3	+ 0 43.0	+0.3982	0.5860	-0.0950	+45	-19
c^2 Ophiuchi	5	0.58	2.7	23 52.7	4 28.4	+ 2 39.4	+0.0103	0.5865	0.0898	+23	-41
63 Ophiuchi	6½	0.66	2.6	24 51.9	13 45.0	+11 34.2	+0.2981	0.5908	0.0655	+36	-24
4 Sagittarii	5½	0.67	2.3	23 48.3	15 41.4	-10 34.1	-0.9061	0.5919	0.0598	-30	-90
7 Sagittarii	6	0.69	2.3	24 16.8	16 52.8	- 9 25.6	-0.4897	0.5916	0.0569	- 7	-74
9 Sagittarii	6	+0.69	- 2.3	-24 21.8	17 16.6	- 9 2.7	-0.4268	0.5916	-0.0558	- 4	-69
B. A. C. 6161	5½	0.72	2.0	23 43.5	20 21.2	- 6 5.5	-1.2363	0.5932	0.0470	-59	-90
λ Sagittarii	3	0.79	2.1	25 28.9	**15** 2 38.2	- 0 3.6	+0.3157	0.5946	0.0295	+34	-23
24 Sagittarii	6	0.81	1.8	24 6.8	4 57.4	+ 2 9.9	-1.1390	0.5957	0.0227	-50	-90
25 Sagittarii	6½	0.82	1.5	24 18.3	5 12.5	+ 2 24.5	-0.9491	0.5954	0,0221	-36	-90
B. A. C. 6369	6	+0.86	- 1.8	-25 7.2	9 9.9	+ 6 12.2	-0.1833	0.5965	-0.0107	+ 6	-53
σ Sagittarii	2½	0.92	1.9	26 25.9	13 10.0	+10 2.7	+1.1310	0.5965	+0.0009	+64	+33
ψ Sagittarii	5½	1.01	1.2	25 26.7	21 0.3	- 6 26.4	+0.2153	0.5967	0.0237	+29	-29
χ^1 Sagittarii	5½	1.04	0.8	24 43.3	**16** 0 46.6	- 2 49.0	-0.4044	0.5958	0.0341	- 4	-68
χ^2 Sagittarii	6½	1.04	0.7	24 37.6	0 49.2	- 2 46.5	-0.4992	0.5958	0.0344	- 9	-75
χ^3 Sagittarii	5½	+1.16	- 0.6	-24 10.7	0 52.6	- 2 43.2	-0.9528	0.5958	+0.0345	-35	-90
h^1 Sagittarii	6	1.12	0.6	24 57.6	4 56.0	+ 1 10.4	+0.0068	0.5954	0.0461	+18	-41
h^2 Sagittarii	4½	1.12	0.6	25 7.5	5 11.4	+ 1 25.1	+0.1861	0.5951	0.0464	+29	-30
53 Sagittarii	6½	1.12	0.1	23 40.6	6 25.6	+ 2 36.3	-1.2320	0.5949	0.0504	-58	-90
B. A. C. 6727	6	1.12	- 0.1	23 40.8	6 32.5	+ 2 43.0	-1.2170	0.5949	0.0507	-57	-90
17 Capricorni	6	+1.44	+ 2.3	-21 54.7	**17** 8 32.0	+ 3 40.4	-0.7663	0.5851	+0.1198	-16	-90
χ Capricorni	5½	1.55	3.2	21 38.0	17 34.8	-11 37.8	+0.1350	0.5801	0.1415	+34	-34
27 Capricorni	6½	1.55	3.5	20 59.7	17 59.1	-11 14.4	-0.4543	0.5808	0.1425	+ 4	-71
φ Capricorni	5½	1.58	3.5	21 6.4	20 28.3	- 8 50.8	+0.0186	0.5790	0.1482	+28	-40
33 Capricorni	5½	1.63	3.7	21 19.1	23 58.6	- 5 28.9	+0.7313	0.5768	0 1558	+68	0
37 Capricorni	6	+1.67	+ 4.2	-20 34.4	**18** 4 25.0	- 1 12.2	+0.7246	0 5741	+0.1650	+70	- 1
ε Capricorni	4½	1.77	4.6	19 57.4	5 21.1	- 0 18.2	+0.2551	0.5737	0.1665	+43	-27
κ Capricorni	5	1.70	4.9	19 21.9	7 41.0	+ 1 56.5	+0.0507	0.5724	0.1714	+33	-38
B. A. C. 7550	6½	1.71	4.6	20 7.3	7 55.0	+ 2 10.0	+0.8564	0.5724	0.1720	+70	+ 7
29 Aquarii *mult.*	6½	1.79	6.2	17 29.5	16 4.1	+10 1.1	-0.3429	0.5666	0.1875	+15	-62
56 Aquarii	6½	+1.90	+ 8.1	-15 8.7	**19** 4 7.7	- 2 21.3	-0.3394	0.5598	+0.2070	+17	-61
τ^1 Aquarii *mult.*	5½	1.99	8.7	14 38.0	11 49.0	+ 5 3.7	+0.7720	0.5549	0.2174	+70	+ 1
τ^2 Aquarii	4	1.99	9.0	14 10.2	12 39.4	+ 5 52.4	+0.4848	0.5545	0.2184	+64	-15
74 Aquarii	6	2.00	9.5	12 11.9	14 24.1	+ 7 33.5	-1.1300	0.5533	0.2210	-28	-90
ψ^2 Aquarii	4	2.07	11.0	9 46.8	**20** 1 25.7	- 5 47.6	-1.0810	0.5482	0.2330	-23	-90
ψ^3 Aquarii	4½	+2.10	+11.0	-10 12.5	1 54.4	- 5 19.8	-0.5347	0.5480	+0.2335	+10	-75
B. A. C. 8274	7	+2.24	+12.6	- 6 59.3	15 32.5	+ 7 50.8	-0.5458	0.5428	+0.2444	+11	-76

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
30 Piscium	4½	+2.30	+12.8	- 6 37.4	20 21 48.2	-10 5.9	+0.6265	0.5415	+0.2482	+80	- 8
33 Piscium	5	2.31	13.1	6 19.2	23 23.4	- 8 33.8	+0.7147	0.5410	0.2489	+84	- 3
B. A. C. 17	6	2.32	13.2	5 51.3	21 1 43.4	- 6 18.4	+0.8216	0.5403	0.2499	+84	+ 3
14 Ceti	6	2.42	14.7	1 6.4	13 38.4	+ 5 13.3	-1.0190	0.5371	0.2530	-15	-90
15 Ceti	6½	2.43	14.7	- 1 6.4	14 41.9	+ 6 14.4	-0.7516	0.5369	0.2534	+ 2	-90
26 Ceti	6	+2.55	+15.1	+ 0 46.8	22 3 5.6	- 5 45.6	+0.4641	0.5364	+0.2534	+69	-17
29 Ceti	6½	2.57	15.4	1 25.3	5 4.9	- 3 50.0	+0.3106	0.5346	0.2531	+59	-25
33 Ceti	6	2.58	15.4	1 51.9	6 18.6	- 2 38.7	+0.1672	0.5346	0.2527	+50	-32
35 Ceti	6½	2.59	15.3	1 53.6	7 15.1	- 1 44.1	+0.3787	0.5357	0.2525	+63	-21
f Piscium	5	2.61	15.7	3 2.3	9 45.7	+ 0 41.7	-0.1624	0.5364	0.2521	+33	-50
μ Piscium	5	+2.67	+16.4	+ 5 34.8	15 37.8	+ 6 22.5	-1.2980	0.5370	+0.2502	-40	-84
ν Piscium	4½	2.71	15.7	4 56.1	21 0.6	+11 34.9	+0.7020	0.5371	0 2473	+90	- 4
64 Ceti	5½	2.84	15.6	8 3.6	23 11 10.2	+ 1 17.0	+0.9276	0.5395	0.2379	+90	+11
ξ¹ Ceti	4½	2.85	15.6	8 20.1	11 56.3	+ 2 1.5	+0.8262	0.5398	0.2372	+90	+ 6
ξ Arietis	5½	2.91	15.6	·10 7.0	17 28.5	+ 7 22.9	+0.2844	0.5409	0.2324	+57	-24
B. A. C. 755	6½	+2.91	+15.6	+10 4.4	18 23.3	+ 8 15.9	+0.5414	0.5409	+0.2314	+76	-10
31 Arietis	5½	2.97	15.5	11 58.6	22 58.1	-11 18.3	-0.3800	0.5425	0.2267	+21	-59
38 Arietis	5	2.99	15.1	11 59.2	24 2 51.6	- 7 32.5	+0.4844	0.5437	0.2223	+71	-12
ω² Tauri	5½	3.25	10.6	20 18.6	25 20 39.1	+ 8 50.0	-0.1828	0.5571	0.1567	+31	-39
NEPTUNE				19 34.6	22 37.1	+10 43.9	+0.8948	0.5584	0.1528	+90	+20
τ Tauri	4½	+3.43	+ 8.8	+22 45.0	26 7 37.4	- 4 34.6	-1.1640	0.5595	+0.1344	-33	-67
121 Tauri	6	3.51	4.5	23 58.1	27 6 46.2	- 6 15.1	+0.0535	0.5633	0.0828	+44	-19
132 Tauri	5½	3.46	+ 3.4	24 32.0	12 37.9	- 0 36.1	-0.1108	0.5633	0.0685	+35	-26
ε Geminorum	3½	3.38	- 1.3	25 14.5	28 12 26.6	- 1 38.4	+0.0794	0.5613	+0.0110	+46	-11
37 Geminorum	6½	3.34	2.4	25 30.8	17 24.8	+ 3 9.3	-0.1899	0.5598	-0.0013	+30	-25
39 Geminorum	6½	+3.35	- 2.6	+26 13.5	18 55.9	+ 4 37.2	-0.9657	0.5593	-0.0042	-18	-64
40 Geminorum	6½	3.35	3.2	26 3.8	19 13.4	+ 4 54.0	-0.7920	0.5590	0.0051	- 5	-64
ω Geminorum	5½	3.29	3.5	24 22.2	20 33.1	+ 6 11.0	+1.0380	0.5590	0.0081	+90	+43
48 Geminorum	6	3.27	3.6	24 18.8	29 0 58.3	+10 26.8	+1.0410	0.5569	0.0187	+90	+43
52 Geminorum	6½	3.29	3.9	25 4.5	1 57.0	+11 23.5	+0.1938	0.5567	0.0208	+53	- 7
A Geminorum	5½	+3.29	- 4.6	+25 15.6	5 50.5	- 8 51.2	-0.1071	0.5555	-0.0300	+35	-23
κ Geminor. *mult.*	3½	3.14	6.1	24 39.7	15 13.8	+ 0 12.6	+0.1658	0.5520	0.0510	+51	-10
ω² Cancri	6½	3.06	7.5	25 23.4	23 2.4	+ 7 45.2	-1.1043	0.5488	0.0685	-29	-65
λ Cancri	5½	2.97	8.6	24 22.0	30 7 42.1	- 7 52.6	-0.6521	0.5448	0.0864	+ 4	-62
υ² Cancri	5½	2.93	9.2	24 30.5	11 27.2	- 4 15.0	-1.1507	0.5429	0.0942	-33	-65
υ³ Cancri	6	+2.90	- 9.3	+24 27.1	12 48.5	- 2 56.3	-1.2170	0.5423	-0.0966	-41	-66
γ Cancri	4½	+2.79	- 9.5	+21 51.8	18 23.6	+ 2 27.8	+1.0643	0.5394	-0.1079	+90	+36

DECEMBER.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
ξ Cancri	5	+2.65	-11.2	+22 29.3	1 6 50.9	- 9 29.0	-1.1130	0.5321	-0.1300	-28	-68
79 Cancri	6½	2.77	11.2	22 26.4	7 19.9	- 9 0.9	-1.1240	0.5319	0.1310	-29	-68
B. A. C. 3138	6½	2.63	11.4	21 44.1	8 55.9	- 7 27.9	-0.5544	0.5307	0.1339	+11	-60
B. A. C. 3206	6½	2.53	11.5	20 15.7	14 24.6	- 2 9.6	+0.3149	0.5271	0.1431	+60	-12
η Leonis	3½	2.24	12 4	17 17.8	2 11 50.0	- 5 23.4	+0.1864	0.5162	0.1744	+52	-23
42 Leonis	6	+2.12	-12.5	+15 31.6	19 20.3	+ 1 53.5	+0.8116	0.5132	-0.1838	+90	+ 9
i Leonis	5½	2.07	12.7	14 41.8	3 0 44.7	+ 7 8.4	+0.7086	0.5113	0.1901	+90	+ 3
k Leonis	5½	1.97	13.0	14 46.3	8 14.3	- 9 35.0	-0.8305	0.5086	0.1984	- 4	-75
ι Leonis *mult.*	4	1.72	12.8	11 7.9	4 4 19.6	+ 9 56.0	-0.9817	0.5029	0.2164	-13	-79
ω Virginis	6	1.69	12.0	8 44.4	12 13.4	- 6 23.5	-0.0807	0.5018	0.2222	+37	-43
ξ Virginis	5½	+1.57	-12.2	+ 8 52.1	15 55.8	- 2 47.4	-1.0480	0.5007	-0.2246	-18	-81
ν Virginis	4	1.56	11.6	7 8.7	16 15.5	- 2 28.2	+0.7731	0.5008	0.2248	+90	+ 2
π Virginis	4½	1.48	11.6	7 13.5	5 0 25.8	+ 5 28.5	-1.1720	0.5012	0.2293	-27	-83
c Virginis	5½	1.35	10.8	3 55.4	11 3.5	- 8 11.7	-0.0200	0.5001	0.2339	+40	-41
B. A. C. 4254	6	1.28	10.4	+ 2 27.6	20 49.6	+ 1 18.0	-0.7278	0.5025	0.2374	+ 3	-85
65 Virginis	6	+1.06	- 8.5	- 4 21.0	6 20 49.1	+ 0 36.7	+0.9139	0.5095	-0.2387	+86	+ 8
*l*² Virginis	5	+1.08	- 8.2	- 5 41.4	7 1 20.9	+ 5 0.6	+1.2700	0.5116	-0.2381	+84	+36

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	″	° ′	d h m	h m				°	°
80 Virginis	6	+1.04	- 8.4	- 4 50.2	7 3 12.2	+ 6 48.6	-0.0858	0.5133	-0.2380	+36	-46
94 Virginis	6½	0.92	7.2	8 22.1	18 56.1	- 1 55.6	-0.0178	0.5210	0.2319	+38	-42
95 Virginis	6	0.92	7.1	8 47.4	19 9.0	- 1 43.0	+0.3823	0.5210	0.2317	+61	-21
κ Virginis	4½	0.90	6.9	9 45.8	22 13.8	+ 1 16.2	+0.7013	0.5228	0.2300	+80	- 4
2 Libræ	6½	0.88	5.5	11 12.8	8 3 26.3	+ 6 19.0	+1.0440	0.5274	0.2270	+79	+18
μ Libræ	5½	+0.81	- 5.9	-13 41.3	15 57.4	- 5 33.7	+0.8652	0.5366	-0.2170	+76	+ 6
o^1 Libræ	6½	0.76	5.0	15 9.1	9 6 42.2	+ 8 41.9	-0.6892	0.5490	0.2005	- 2	-90
ζ^1 Libræ	6	0.75	4.8	16 20.0	9 57.6	+11 50 7	-0.1040	0.5522	0.1959	+29	-47
ζ^3 Libræ	6	0.74	4.8	16 13.9	11 3.0	-11 6.1	-0.4221	0.5521	0.1941	+12	-67
ζ^4 Libræ	4½	0.74	4.7	16 28.8	12 3.4	-10 7.8	-0.3598	0.5533	0.1928	+15	-63
β^1 Scorpii	2	+0.72	- 4.0	-19 30.3	10 2 14.7	+ 3 33.6	+0.1890	0.5652	-0.1701	+40	-31
β^2 Scorpii	5½	0.72	4.0	19 30.1	2 14.8	+ 3 33.7	+0.1856	0.5665	0.1701	+41	-31
ω^1 Scorpii	4½	0.72	3.8	20 22.3	2 49.0	+ 4 6.6	+0.9863	0.5675	0.1692	+70	+16
ω^2 Scorpii	4½	0.72	3.8	20 34.3	3 3.9	+ 4 21.0	+1.1495	0.5675	0.1684	+69	+30
ν^2 Scorpii	4½	0.71	3.9	19 10.6	5 3.0	+ 6 15.7	-0.6191	0.5689	0.1646	- 3	-85
ψ Ophiuchi	4½	+0.69	- 3.7	-19 46.9	10 8.5	+11 9.9	-0.8084	0.5725	-0.1546	-15	-90
ω Ophiuchi	4½	0.70	3.5	21 13.9	13 27.3	- 9 38.6	+0.1758	0.5761	0.1477	+37	-31
VENUS				20 27.2	13 27.3	- 9 38.6	-0.6266	0.6009	0.1630	- 4	-87
				NEW	*MOON.*						
λ Sagittarii	3	+0.83	- 1.7	-25 28.9	12 10 46.2	+ 9 52.1	+0.3003	0.6043	-0.0303	+33	-24
MERCURY				25 35.8	11 41.5	+10 45.2	+0.3898	0.5417	-0.0293	+39	-19
ψ Sagittarii	5½	0 92	0.6	25 26.7	13 4 36.3	+ 2 57.6	+0.2037	0.6046	+0.0233	+25	-29
χ^1 Sagittarii	5½	0.93	0.5	24 43.3	8 15.9	+ 6 28.0	-0.4140	0.6057	0.0344	- 5	-68
χ^2 Sagittarii	6½	0.93	0.6	24 37.6	8 18.3	+ 6 30.3	-0.5075	0.6057	0.0347	- 9	-76
χ^3 Sagittarii	5½	+0.93	- 0.5	-24 10.7	8 21.4	+ 6 33.3	-0.9548	0.6057	+0.0347	-35	-90
h^1 Sagittarii	6	0.97	0.4	24 57.6	12 17.8	+10 19.8	-0.0101	0.6054	0.0467	+18	-42
h^2 Sagittarii	4½	0.97	- 0.4	25 7.5	12 32.7	+10 34.1	+0.1653	0.6054	0.0476	+27	-32
17 Capricorni	6	1.19	+ 1.9	21 54.8	14 15 5.4	-11 58.7	-0.7762	0.5949	0.1222	-16	-90
χ Capricorni	5½	1.28	2.5	21 38.0	23 53.6	- 3 31.5	+0.1152	0.5889	0.1435	+33	-35
27 Capricorni	6½	+1.28	+ 2.7	-20 59.7	15 0 17.4	- 3 8.6	-0.4658	0.5875	+0.1443	+ 4	-72
φ Capricorni	5½	1.30	2.5	21 6.4	2 42.7	- 0 49.1	0.0000	0.5869	0.1502	+28	-41
33 Capricorni	5½	1.34	2.9	21 19.1	6 7.9	+ 2 28.2	+0.7362	0.5838	0.1578	+68	0
35 Capricorni	6	1.35	2.9	21 40.2	7 22.3	+ 3 39.7	+1.2880	0.5829	0.1605	+68	+50
37 Capricorni	6	1.38	3.4	20 34.4	10 28.1	+ 6 38.3	+0.6977	0.5808	0.1669	+70	- 2
ε Capricorni	4½	+1.39	+ 3.6	-19 57.4	11 22.8	+ 7 31.0	+0.2321	0.5797	+0.1691	+42	-28
κ Capricorni	5	1.41	3.8	19 21.9	13 39.6	+ 9 42.6	+0.0301	0.5791	0.1734	+32	-40
B. A. C. 7550	6½	1.42	3.7	20 7.3	13 53.4	+ 9 55.8	+0.8293	0.5790	0.1741	+70	+ 6
29 Aquarii *mult.*	6½	1.49	4.8	17 29.5	21 52.4	- 6 23.2	-0.3595	0.5720	0.1890	+14	-63
56 Aquarii	6½	1.59	6.5	15 8.7	16 9 44.0	+ 5 2.4	-0.3557	0.5642	0.2084	+16	-62
τ^1 Aquarii *mult.*	5½	+1.68	+ 7.0	-14 38.0	17 19.2	-11 38.7	+0.7513	0.5584	+0.2188	+73	0
τ^2 Aquarii	4	1.69	7.2	14 10.3	18 9.3	-10 50.4	+0.4672	0.5575	0.2198	+63	-16
74 Aquarii	6	1.69	7.8	12 12.0	19 52.7	- 9 10.6	-1.1390	0.5563	0.2218	-30	-90
ψ^2 Aquarii	4	1.79	9.1	9 46.8	17 6 49.1	+ 1 23.1	-1.0940	0.5493	0.2337	-23	-90
ψ^3 Aquarii	4½	1.80	9.1	10 12.5	7 17.6	+ 1 50.7	-0.5479	0.5490	0.2339	+10	-76
B. A. C. 8274	7	+1.95	+10.7	- 6 59.3	20 53.6	- 9 0.8	-0.5559	0.5428	+0.2445	+11	-76
30 Piscium	4½	2.01	10.7	6 37.4	18 3 9.9	- 2 56.8	+0.6146	0.5398	0.2477	+79	- 9
33 Piscium	5	2.03	10.9	6 19.2	4 45.4	- 1 24.5	+0.6993	0.5389	0.2482	+84	- 4
B. A. C. 17	6	2.04	11.1	5 51.3	7 6.2	+ 0 51.7	+0.8112	0.5385	0.2493	+84	+ 2
15 Ceti	6½	2.21	13.0	- 1 6.4	20 19.2	-10 20.9	-0.7235	0.5336	0.2520	+ 3	-90
26 Ceti	6	+2.34	+13.4	+ 0 46.8	19 8 42.3	+ 1 38.5	+0.4631	0.5320	+0.2515	+69	-17
29 Ceti	6½	2.36	13.7	1 25.3	10 43.2	+ 3 35.5	+0.3054	0.5315	0.2508	+57	-25
33 Ceti	6	2.38	13.9	1 51.9	11 58.1	+ 4 48.1	+0.1612	0.5311	0.2507	+50	-33
35 Ceti	6½	2.39	13.6	1 53.6	12 55.3	+ 5 43.5	+0.3705	0.5307	0.2503	+63	-22
f Piscium	5	2.42	14.1	3 2.3	15 28.2	+ 8 11.5	-0.1701	0.5310	0.2497	+32	-50
ν Piscium	4½	+2.55	+14.1	+ 4 56.0	20 2 54.5	- 4 43.8	+0.7052	0.5311	+0.2447	+90	- 4
64 Ceti	5½	+2.74	+14.4	+ 8 3.5	17 20.6	+ 9 14.8	+0.9324	0.5325	+0.2350	+90	+12

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
ξ^1 Ceti	4½	+2.75	+14.5	+ 8 20.0	20 18 7.5	+10 0.2	+0.8303	0.5325	+0.2340	+90	+ 6
ξ Arietis	5½	2.83	14.7	10 6.9	23 46.7	− 8 31.4	+0.2870	0.5348	0.2295	+58	−23
B. A. C. 755	6½	2.84	14.7	10 4.3	21 0 42.6	− 7 37.3	+0.5462	0.5348	0.2286	+76	−10
31 Arietis	5½	2.91	14.8	11 58.5	5 23.3	− 3 5.7	−0.3832	0.5358	0.2236	+21	−59
38 Arietis	5	2.96	14.5	11 59.2	9 21.6	+ 0 45.0	+0.4852	0.5369	0.2198	+71	−12
B. A. C. 1119	6	+3.29	+12.8	+16 10.9	22 10 49.0	+ 1 22.3	+1.2450	0.5405	+0.1834	+90	+44
B. A. C. 1242	6½	3.46	11.1	19 53.6	20 41.3	+10 54.7	−0.9274	0.5491	0.1686	−12	−70
ω^1 Tauri	6	3.49	11.5	19 19.2	23 0 21.2	− 9 32.8	+0.2868	0.5505	0.1619	+59	−15
ω^2 Tauri	5½	3.54	11.0	20 18.6	4 0.2	− 6 1.3	−0.1858	0.5512	0.1549	+31	−39
NEPTUNE				19 27.2	4 36.3	− 5 26.4	+0.8160	0.5525	0.1538	+90	+14
53 Tauri	6	+3.57	+ 9.9	+20 52.7	4 58.1	− 5 5.3	−0.6438	0.5525	+0.1534	+ 6	−67
B. A. C. 1373	6	3.61	10.3	21 22.6	8 48.6	− 1 22.7	−0.5975	0.5533	0.1460	+ 8	−63
W. iv, 650	6	3.62	9.4	20 26.0	13 25.4	+ 3 4.6	+1.0210	0.5547	0.1363	+90	+30
τ Tauri	4½	3.68	9.4	22 45.0	15 9.2	+ 4 44.8	−1.1800	0.5559	0.1331	−35	−67
121 Tauri	6	3.87	4.9	23 58.0	24 14 35.4	+ 3 21.7	+0.0448	0.5609	0.0817	+44	−20
132 Tauri	5½	+3.92	+ 3.7	+24 31.9	20 30.4	+ 9 4.2	−0.1203	0.5616	+0.0679	+34	−27
ε Geminorum	3½	3.96	− 3.5	25 14.5	25 20 27.3	+ 8 10.1	+0.0616	0.5615	+0.0109	+45	−12
ω Geminorum	5½	3.94	3.2	24 22.3	26 4 35.0	− 7 59.5	+1.0160	0.5599	−0.0085	+90	+41
A Geminorum	5½	3.94	5.3	25 15.6	13 52.7	+ 0 58.8	−0.1311	0.5577	0.0304	+34	−24
κ Geminor. *mult.*	3½	3.87	7.2	24 39.6	23 15.1	+10 1.6	+0.1369	0.5550	0.0518	+49	−12
λ Cancri	5½	+3.76	−10.2	+24 21.9	27 15 41.3	+ 1 54.3	−0.6899	0.5475	−0.0872	+ 2	−65
υ^2 Cancri	5½	3.74	10.9	24 30.4	19 25.5	+ 5 31.1	−1.1860	0.5454	0.0951	−37	−65
υ^3 Cancri	6	3.72	11.0	24 27.0	20 46.7	+ 6 49.5	−1.2550	0.5444	0.0975	−48	−66
γ Cancri	4½	3.64	11.5	21 51.7	28 2 20.5	−11 47.6	+1.0240	0.5416	0.1085	+90	+34
ξ Cancri	5	3.52	13.4	22 29.2	14 45.1	+ 0 12.9	−1.1570	0.5345	0.1311	−32	−68
79 Cancri	6½	+3.52	−13.4	+22 26.3	15 13.9	+ 0 40.8	−1.1680	0.5336	−0.1320	−33	−68
B. A. C. 3138	6½	3.49	13.6	21 44.0	16 49.7	+ 2 13.5	−0.6025	0.5329	0.1349	+ 8	−63
B. A. C. 3206	6½	3.40	13.9	20 15.6	22 17.3	+ 7 30.8	+0.2675	0.5304	0.1440	+57	−15
η Leonis	3½	3.14	15.1	17 17.7	29 19 39.9	+ 4 14.1	+0.1275	0.5180	0.1753	+48	−26
42 Leonis	6	3.16	15.4	15 31.6	30 3 10.1	+11 31.0	+0.7366	0.5141	0.1845	+90	+ 5
i Leonis	5½	+2.98	−15.5	+14 41.8	8 34.9	− 7 13.8	+0.6433	0.5112	−0.1905	+86	− 2
k Leonis	5½	2.88	15.9	14 46.3	16 5.6	+ 0 4.0	−0.9040	0.5082	0.1987	− 9	−75
ι Leonis *mult.*	4	2.64	15.6	11 7.9	31 12 17.2	− 4 18.7	−1.0650	0.5011	0.2162	−19	−79
ω Virginis	6	2.52	14.9	8 44.3	20 15.3	+ 3 26.1	−0.1587	0.4997	0.2216	+33	−24
ξ Virginis	5½	+2.48	−15.2	+ 8 52.0	23 59.9	+ 7 4.4	−1.1323	0.4982	−0.2236	−24	−81

OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1890.

Date.	The Star's		IMMERSION.				EMERSION.				Duration of Occultation.
			Washington.		Angle from		Washington.		Angle from		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
			h m	h m	°	°	h m	h m	°	°	h m
Jan. 3	o Tauri	6	3 49	8 54	50	94	5 12	10 17	276	282	1 23
6	7 Cancri	6½	4 33	9 26	162	219	4 59	9 52	199	255	0 26
	NEW MOON.										
24	B. A. C. 17	6	1 11	4 54	86	67	2 15	5 58	207	175	1 4
29	ε Tauri	3½	9 21	12 43	83	28	10 24	13 46	262	209	1 3
31	3 Geminorum	6½	9 8	12 23	53	356	10 8	13 22	312	254	1 0
31	6 Geminorum	6½	10 34	13 49	111	53	11 38	14 52	267	211	1 4
Feb. 2	84 Geminorum	6½	9 22	12 29	182	137	9 40	12 47	205	156	0 18
9	80 Virginis	6	12 45	15 23	114	127	14 7	16 45	317	307	1 22
12	ν^2 Scorpii	4½	13 46	16 12	143	172	14 53	17 19	270	286	1 7
	NEW MOON.										
Mar. 6	ν Virginis	4	12 30	13 30	82	65	13 30	14 30	347	313	1 0
9	94 Virginis	6½	11 11	11 59	155	193	12 11	12 59	270	302	1 0
	NEW MOON.										
29	μ^1 Cancri	6½	8 35	8 5	90	67	10 2	9 32	301	250	1 27
Apr. 5	88 Virginis	6½	10 28	9 30	103	144	11 37	10 40	324	354	1 9
5	B. A. C. 4647	6½	15 36	14 38	125	98	16 49	15 51	301	262	1 13
7	ζ^3 Libræ †	6	10 10	9 5	123	174	11 8	10 2	289	340	0 58
7	ζ^4 Libræ	5½	11 17	10 12	119	164	12 20	11 15	295	331	1 3
13	κ Capricorni	5	16 46	15 16	45	91	17 41	16 11	291	334	0 55
	NEW MOON.										
22	105 Tauri	6	9 34	7 30	109	52	10 35	8 32	244	189	1 1
23	1 Geminorum	5	11 19	9 11	128	72	12 7	9 59	239	186	0 48
25	82 Geminorum	6½	10 52	8 36	110	53	12 3	9 47	281	223	1 11
May 13	B. A. C. 17	6	18 45	15 16	11	62	19 20	15 51	300	348	0 35
	NEW MOON.										
20	B. A. C. 1801	6	11 54	8 0	32	339	12 24	8 30	329	279	0 30
June 3	63 Ophiuchi	6½	18 24	13 34	147	140	19 15	14 25	226	207	0 51
6	χ Capricorni	5½	18 56	13 53	347	14	Star 0′.3	north of	☽'s	limb.	
	NEW MOON.										
22	i Leonis	5½	14 18	8 14	28	335	Star 1′.5	north of	☽'s	limb.	
26	80 Virginis	6	14 8	7 47	35	24	Star 0′.5	north of	☽'s	limb.	
July 1	λ Sagittarii	3	18 26	11 46	139	138	19 22	12 41	228	216	0 56
2	h^1 Sagittarii	6	19 3	12 18	40	46	19 59	13 14	308	302	0 56
2	h^2 Sagittarii	4½	19 11	12 26	81	85	20 30	13 44	265	253	1 18
5	τ^1 Aquarii *mult*	5½	21 18	14 21	88	105	22 30	15 33	220	223	1 12
5	τ^2 Aquarii	4	22 46	15 49	44	42	0 0	17 3	270	254	1 14
11	B. A. C. 1206	6	22 11	14 50	45	98	23 8	15 47	266	330	0 57
	NEW MOON.										
24	95 Virginis	6	15 51	7 40	114	87	17 9	8 58	305	265	1 18

Note. The angles of position are counted from the north point and vertex of the moon's limb, toward the east.
* Whole occultation below the horizon of Washington.
† Immersion below the horizon of Washington.
‡ Emersion below the horizon of Washington.

OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1890.

Date.	The Star's		Immersion.				Emersion.				Duration of Occultation.
			Washington.		Angle from		Washington.		Angle from		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
			h m	h m	°	°	h m	h m	°	°	h m
July 24	κ Virginis *	4	20 16	12 5	186	136	20 29	12 18	213	163	0 13
28	63 Ophiuchi	6½	18 53	10 26	141	128	19 47	11 21	228	204	0 54
31	χ Capricorni	5½	16 53	8 14	32	77	17 35	8 57	310	350	0 43
31	φ Capricorni	5½	21 6	12 27	340	341	Star 2′.0	north of	☽'s	limb.	
Aug. 3	33 Piscium †	4½	17 59	9 8	10	61	18 24	9 33	312	2	0 25
3	B. A. C. 17	6	20 14	11 23	36	80	21 14	12 23	272	309	1 0
7	B. A. C. 1119	6	23 34	14 26	48	102	0 43	15 35	256	306	1 9
9	n Tauri †	5½	22 6	12 51	77	125	23 0	13 45	250	302	0 54
	NEW MOON.										
23	ω Ophiuchi ‡	4½	20 51	10 42	75	30	21 50	11 40	301	251	0 58
24	b Ophiuchi *var.*	5	18 21	8 8	117	104	19 37	9 24	260	232	1 16
24	c^2 Ophiuchi	5	21 14	11 0	43	0	21 58	11 44	320	274	0 44
25	λ Sagittarii	3	17 45	7 28	98	105	19 7	8 50	270	260	1 22
26	h^2 Sagittarii	4½	20 1	9 40	60	53	21 15	10 53	281	259	1 13
26	h^1 Sagittarii	6	20 20	9 59	351	340	Star 0′.6	north of	☽'s	limb.	
29	τ^1 Aquarii *mult.*	5½	21 20	10 47	113	132	22 7	11 34	189	197	0 47
29	τ^2 Aquarii	4	22 32	11 59	69	71	23 45	13 11	226	211	1 13
Sept. 5	ι Tauri	5	23 10	12 8	110	164	23 53	12 52	210	267	0 44
	NEW MOON.										
22	ψ Sagittarii	5½	22 32	10 25	55	17	23 32	11 24	282	237	1 0
27	B. A. C. 17	6	20 41	8 13	73	114	21 48	9 21	225	257	1 8
28	29 Ceti	6½	0 6	11 34	348	5	0 36	12 4	300	308	0 30
28	33 Ceti	6	1 47	13 15	359	345	2 31	13 59	289	263	0 44
28	35 Ceti	6½	2 29	13 57	63	38	3 41	15 9	229	190	1 12
Oct. 2	W. iv, 650	6	22 7	9 20	79	131	23 2	10 15	240	295	0 55
	NEW MOON.										
14	κ Virginis	4	19 42	6 9	21	330	Star 1′.3	north of	☽'s	limb.	
23	τ^2 Aquarii	4	20 24	6 15	335	6	Star 1′.2	north of	☽'s	limb.	
31	5 Geminorum	6½	2 28	11 46	95	153	3 41	12 59	237	293	1 13
Nov. 1	52 Geminorum	6½	7 48	17 1	63	34	9 2	18 16	314	261	1 14
	NEW MOON.										
18	B. A. C. 7550	6½	0 24	8 32	143	109	0 50	8 58	185	148	0 26
28	ε Geminorum	3½	3 51	11 19	24	82	4 36	12 4	317	11	0 45
29	κ Geminor. *mult.*	3½	7 11	14 35	82	101	8 39	16 2	297	334	1 28
Dec. 1	B. A. C. 3206	6½	5 24	12 40	116	172	6 44	14 0	272	324	1 20
2	η Leonis †	3½	2 46	9 58	53	101	3 24	10 36	329	19	0 38
	NEW MOON.										
15	33 Capricorni	5½	0 15	6 36	95	65	1 9	7 31	215	172	0 55
18	B. A. C. 17	6	0 40	6 50	99	90	1 33	7 43	188	165	0 53
19	26 Ceti	6	2 50	8 56	69	38	4 1	10 7	223	181	1 11
19	29 Ceti	6½	5 31	11 36	70	20	6 31	12 36	235	184	1 0
21	38 Arietis	5	3 3	9 1	82	72	4 19	10 16	215	179	1 15

NOTE.—The angles of position are counted from the north point and vertex of the moon's limb, toward the east
* Whole occultation below the horizon of Washington.
† Immersion below the horizon of Washington.
‡ Emersion below the horizon of Washington.

DOWNES'S TABLE GIVING VALUES OF τ.

FOR COMPUTING THE TIME AND HOUR-ANGLE OF APPARENT CONJUNCTION.

h	Lat. 72°			Lat. 66°			Lat. 60°			Lat. 54°			Lat. 48°			Lat. 42°			Lat. 36°		
	x′			*x′*			*x′*			*x′*			*x′*			*x′*			*x′*		
	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50
h m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	2	2	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	6	5	6	7
20	3	3	4	4	5	5	5	6	7	6	7	9	8	9	11	9	10	12	11	12	14
30	5	5	6	6	7	8	8	9	11	10	11	13	12	13	16	14	16	18	16	18	22
40	6	7	8	8	9	11	11	12	14	13	15	17	16	18	21	18	21	24	21	24	29
50	7	8	10	10	11	13	13	15	17	16	19	21	19	22	26	22	26	30	26	30	36
1 0	9	10	11	12	14	16	16	18	21	19	22	26	23	26	31	26	31	36	30	35	42
10	10	12	13	14	16	18	18	21	24	22	26	30	26	30	36	31	35	42	35	40	48
20	12	13	15	16	18	21	21	23	27	25	29	34	30	34	40	35	40	47	39	45	54
30	13	15	17	18	20	23	23	26	30	28	32	37	33	38	45	39	44	52	43	50	59
40	14	16	18	20	22	25	25	29	33	31	35	41	36	42	49	42	48	57	47	54	64
50	16	18	20	21	24	28	27	31	36	34	38	44	39	45	53	45	52	61	51	58	68
2 0	17	19	22	23	26	30	29	33	39	36	41	47	42	48	56	48	55	65	54	62	72
10	18	20	23	25	28	32	31	36	41	38	43	50	45	51	59	51	59	68	57	66	76
20	19	22	24	26	30	34	33	38	43	40	46	53	47	54	62	54	62	71	60	69	80
30	20	23	26	28	31	36	35	40	45	42	48	55	50	56	65	57	64	74	63	72	83
40	21	24	27	29	33	37	37	42	47	44	50	58	52	59	68	59	67	77	65	74	86
50	22	25	28	30	34	39	38	43	49	46	52	60	54	61	70	61	69	79	68	76	88
3 0	23	26	30	31	35	40	40	45	51	48	54	62	56	63	72	63	71	81	70	79	90
10	24	27	31	33	36	42	41	46	53	49	56	63	57	65	74	65	73	83	72	81	92
20	25	28	32	34	38	43	42	47	54	51	57	65	59	66	75	66	74	85	73	82	93
30	26	29	33	35	39	44	43	49	55	52	58	66	60	67	77	68	76	86	74	83	95
40	26	29	33	36	40	45	44	50	56	53	59	67	61	69	78	69	77	87	75	84	96
50	27	30	34	36	41	46	45	51	57	54	60	68	62	70	79	70	78	88	76	85	96
4 0	28	31	35	37	41	47	46	52	58	55	61	69	63	70	79	71	79	89	77	86	97
10	28	31	35	38	42	47	47	52	59	56	62	70	64	71	80	71	79	89	78	86	97
20	29	32	36	38	42	48	47	53	59	56	62	70	64	71	80	72	80	89	78	87	97
30	29	32	36	39	43	48	48	53	60	57	63	71	65	72	81	72	80	90	79	87	97
40	29	33	37	39	43	49	48	53	60	57	63	71	65	72	81	72	80	89	79	87	97
50	30	33	37	39	44	49	48	54	60	57	63	71	65	72	81	72	80	89	79	87	96
5 0	30	33	37	39	44	49	49	54	60	57	63	71	65	72	80	72	80	89	78	86	95
10	30	33	37	40	44	49	49	54	60	57	63	71	65	72	80	72	79	88	78	86	95
20	30	33	37	40	44	49	49	54	60	57	63	71	65	71	79	72	79	88	78	85	94
30	30	33	37	40	44	49	49	54	60	57	63	70	64	71	79	71	78	87	77	85	93
40	30	33	37	39	44	49	48	53	59	56	62	70	64	70	78	70	77	86	76	84	91
50	30	33	37	39	43	48	48	53	59	56	61	69	63	70	77	70	77	85	75	83	90
6 0	30	33	37	39	43	48	48	52	58	55	61	68	63	69	76	69	76	84	74	82	89
10	30	33	37	39	43	47	47	52	58	55	60	67	62	68	75	68	75	82	73	80	87
20	29	32	36	38	42	47	47	51	57	54	60	66	61	67	74	67	73	81	72	79	85
30	29	32	36	38	42	46	46	51	56	53	59	65	60	66	73	66	72	80	71	78	84
40	29	32	35	37	41	46	45	50	55	53	58	64	59	65	71	65	71	78	70	76	82
50	28	31	35	37	40	45	45	49	54	52	57	62	58	63	70	63	69	76	68	74	80
7 0	28	31	34	36	40	44	44	48	53	51	55	61	57	62	68	62	68	75	67	73	78
10	27	30	34	35	39	43	43	47	52	50	54	60	56	61	67	61	66	73	65	71	76
20	27	30	33	35	38	42	42	46	51	48	53	58	54	59	65	59	65	71	64	69	74
30	26	29	32	34	37	41	41	45	49	47	52	57	53	58	63	58	63	69	62	67	71
40	26	28	31	33	36	40	40	44	48	46	50	55	51	56	62	56	61	67			
50	25	27	31	32	35	39	39	42	47	45	49	53	50	54	60	54	59	65			
8 0	24	27	30	31	34	38	38	41	45	43	47	52	48	52	58	53	57	63			
10	24	26	29	30	33	37	36	40	44	42	46	50	47	51	56	52	55	60			
20	23	25	28	29	32	35	35	38	42	40	44	48	45	49	54						
30	22	24	27	28	31	34	34	37	41	39	42	46	43	47	52						
40	21	23	26	27	30	33	33	35	39	37	41	44	41	45	49						
50	20	22	25	26	28	31	31	34	37	36	39	42	40	43	47						
9 0	19	21	24	25	27	30	30	32	35	34	37	40									
10	18	20	22	24	26	28	28	31	34	32	35	38									
20	18	19	21	22	24	27	27	29	32	31	33	36									
30	16	18	20	21	23	25	25	27	30	29	31	34									
40	15	17	19	20	22	24	24	25	28	27	29	32									

(Concluded at bottom of next page.)

DOWNES'S TABLE GIVING VALUES OF τ.

FOR COMPUTING THE TIME AND HOUR-ANGLE OF APPARENT CONJUNCTION.

h	Lat. 30°			Lat. 24°			Lat. 18°			Lat. 12°			Lat. 6°			Lat. 0°		
	x′			*x′*			*x′*			*x′*			*x′*			*x′*		
	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50
h m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	6	7	8	7	7	9	7	8	9	7	8	10	7	8	10	8	9	11
20	12	14	16	13	14	18	14	16	19	14	16	20	14	17	21	15	18	21
30	17	20	24	19	22	27	20	24	29	21	25	30	21	25	31	22	26	32
40	23	27	32	25	29	36	26	32	39	28	33	40	28	34	41	29	34	42
50	28	33	40	31	36	44	32	39	48	35	40	50	35	42	51	35	42	52
1 0	33	39	47	36	42	52	38	46	56	40	47	59	41	49	60	41	49	61
10	38	45	54	41	48	59	44	52	63	46	54	67	47	56	68	47	56	69
20	43	50	60	46	54	65	49	58	70	52	60	74	53	62	75	53	63	76
30	48	55	66	51	60	71	54	64	76	57	66	79	58	68	81	59	69	82
40	52	60	71	56	65	77	59	69	82	62	72	84	63	73	87	64	74	88
50	56	64	76	60	69	82	64	74	87	66	77	89	68	78	92	68	79	93
2 0	59	68	80	64	73	86	68	78	91	70	81	95	72	83	97	72	83	98
10	62	72	84	67	77	90	71	81	95	74	85	99	75	87	101	76	87	102
20	65	75	87	70	81	94	74	85	99	77	88	103	78	90	105	79	91	106
30	68	78	90	73	84	97	77	88	102	80	91	106	81	93	108	82	94	109
40	71	81	93	76	87	100	80	91	105	83	94	109	84	96	111	85	97	112
50	74	83	96	78	89	102	82	93	107	85	96	111	87	98	113	87	99	114
3 0	76	85	98	80	91	104	84	95	109	87	98	113	89	100	115	89	101	116
10	77	87	99	82	92	106	86	97	111	89	100	114	91	102	116	91	103	117
20	79	89	101	84	94	107	88	99	112	91	102	115	92	104	118	93	104	118
30	80	90	102	85	95	108	89	100	113	92	103	116	94	105	119	94	105	119
40	81	91	103	86	96	109	90	101	114	93	104	117	95	106	119	95	106	120
50	82	92	104	87	97	110	91	101	114	94	104	118	95	106	120	96	107	120
4 0	83	92	104	88	98	110	92	102	114	94	105	118	96	107	120	97	107	120
10	84	93	104	88	98	110	92	102	114	95	105	118	96	107	120	97	107	120
20	84	93	104	89	98	110	92	102	114	95	105	117	96	107	119	97	107	120
30	84	93	104	89	98	110	92	102	114	95	105	117	96	107	119	97	107	119
40	84	93	104	89	98	109	92	102	113	95	104	116	96	106	118	97	107	119
50	84	93	103	88	97	108	92	101	113	94	104	115	96	106	117	96	106	118
5 0	84	92	102	88	97	108	91	101	112	94	103	114	95	105	116	96	105	117
10	83	92	102	88	96	107	91	100	110	93	102	113	95	104	115	95	104	115
20	83	91	101	87	95	106	90	99	109	92	101	112	94	103	114	94	103	114
30	82	90	100	86	94	104	89	98	108	92	100	111	93	102	112	93	102	113
40	81	89	98	85	93	103	88	97	106	91	99	109	92	100	110			
50	80	88	97	84	92	101	87	95	105	89	97	107						
6 0	79	87	95	83	91	100	86	94	103	88	96	105						
10	78	85	94	82	89	98	84	92	101									
20	77	84	92	80	88	96	82	91	99									
30	75	82	90	79	86	94												
40	74	81	88	77	84	92												
50	72	79	86															
7 0	71	77	84															

(Concluded from preceding page.)

h	Lat. 72°			Lat. 66°			Lat. 60°			*h*	Lat. 72°			Lat. 66°			Lat. 60°		
	x′			*x′*			*x′*				*x′*			*x′*			*x′*		
	.62	.56	.50	.62	.56	.50	.62	.56	.50		.62	.56	.50	.62	.56	.50	.62	.56	.50
h m	m	m	m	m	m	m	m	m	m	h m	m	m	m	m	m	m	m	m	m
9 50	14	16	18	18	20	22	22	24	26	11 0	7	8	8	9	10	11	10	11	12
10 0	13	15	16	17	19	21	20	22	24	10	6	6	7	7	8	9	9	9	10
10	12	14	15	16	17	19	19	21	22	20	5	5	6	6	6	7	7	8	8
20	11	12	14	15	16	17	17	19	20	30	3	4	4	4	5	5			
30	10	11	12	13	14	16	16	17	18	40	2	3	3	3	3	4			
40	9	10	11	12	13	14	14	15	16	50	1	1	1	1	2	2			
50	8	9	10	10	11	12	12	13	14	12 0	0	0	0	0	0	0			

FOR WASHINGTON MEAN NOON.

Date.		k	i	θ	L	Date.		k	i	θ	L
Jan.	1	0.889	39°.0	357°.4	41.7	July	0	0.534	86°.1	169°.3	47.6
	6	0.802	52.8	352.1	51.4		5	0.677	69.0	174.6	56.9
	11	0.661	71.2	347.9	61.2		10	0.822	50.0	181.7	65.3
	16	0.455	95.2	342.6	62.4		15	0.937	29.1	191.7	68.4
	21	0.215	124.8	336.7	41.5		20	0.994	9.1	216.4	63.8
	26	0.039	157.1	328.8	9.2		25	0.991	10.9	345.4	54.6
	31	0.021	163.2	204.8	4.8		30	0.954	24.8	5.8	45.6
Feb.	5	0.134	137.0	180.0	26.7	Aug.	4	0.904	36.2	13.3	38.7
	10	0.284	115.5	174.1	36.4		9	0.850	45.6	17.9	34.1
	15	0.420	99.2	170.3	38.7		14	0.797	53.5	21.1	31.3
	20	0.528	86.8	166.9	36.7		19	0.744	60.8	24.5	30.1
	25	0.612	76.5	163.6	33.7		24	0.687	68.0	25.3	29.9
Mar.	2	0.680	68.9	160.3	31.4		29	0.625	75.5	26.8	30.6
	7	0.737	61.7	157.3	30.0	Sept.	3	0.552	84.0	28.1	32.0
	12	0.787	55.0	154.3	29.7		8	0.464	94.1	29.3	33.5
	17	0.833	48.2	151.7	30.4		13	0.356	106.7	31.1	33.4
	22	0.877	41.1	149.2	32.5		18	0.227	123.1	33.9	28.9
	27	0.923	32.2	146.9	36.4		23	0.093	144.5	39.1	15.9
Apr.	1	0.964	21.8	144.0	42.4		28	0.008	169.9	72.9	1.6
	6	0.994	8.9	133.7	50.9	Oct.	3	0.047	154.9	195.7	10.3
	11	0.995	8.4	347.6	60.7		8	0.226	123.3	205.2	41.9
	16	0.942	28.0	336.6	68.2		13	0.467	93.8	208.2	64.3
	21	0.825	49.4	337.2	68.3		18	0.681	68.8	209.6	65.3
	26	0.670	70.1	339.0	61.1		23	0.827	49.1	210.1	55.4
May	1	0.509	88.9	341.3	50.6		28	0.914	34.0	209.7	44.7
	6	0.362	106.0	343.6	39.5	Nov.	2	0.963	22.3	208.2	37.1
	11	0.241	121.2	345.8	29.5		7	0.987	13.3	206.0	30.8
	16	0.137	136.5	348.0	19.1		12	0.997	5.7	200.5	27.2
	21	0.056	152.1	351.6	8.7		17	1.000	1.1	63.4	25.2
	26	0.011	168.1	4.6	1.8		22	0.996	6.9	26.9	24.4
	31	0.004	172.5	121.8	0.7		27	0.987	13.0	21.1	24.7
June	5	0.038	157.6	149.1	6.0	Dec.	2	0.972	19.2	16.1	26.1
	10	0.104	142.4	154.7	14.9		7	0.948	26.2	11.4	28.8
	15	0.190	128.3	158.1	23.6		12	0.912	34.6	6.9	33.2
	20	0.291	114.8	161.4	31.6		17	0.855	44.8	2.3	39.8
	25	0.405	101.0	164.9	39.3		22	0.764	58.0	357.6	48.6
	30	0.534	86.1	169.3	47.6		27	0.621	76.0	353.2	57.5
							32	0.518	99.4	348.9	58.4

NOTATION.

k, the ratio of the illuminated portion of the apparent disk to the entire apparent disk considered as the superficies of a circle.

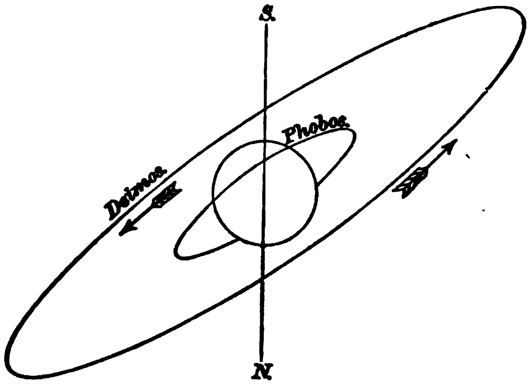
i, the angle between the sun and earth, as seen from the planet.

θ, the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

L, the brilliancy of the disk. The unit of *L* is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the sun, and illuminated by the latter as the mean disk of the planet is illuminated.

FOR WASHINGTON MEAN NOON.

Date		k	i	θ	L	Date.		k	i	θ	L
Jan.	1	0.982	15°.6	180°.2	49.2	July	25	0.739	61°.5	20°.9	79.6
	6	0.985	13.9	176.3	48.7		30	0.722	63.7	21.8	82.8
	11	0.988	12.3	172.3	48.3	Aug.	4	0.704	65.9	22.5	86.4
	16	0.991	10.7	168.0	48.0		9	0.686	68.2	23.0	90.2
	21	0.994	9.1	163.3	47.7		14	0.667	70.4	23.3	94.3
	26	0.996	7.5	157.9	47.4		19	0.648	72.7	23.5	99.0
	31	0.997	6.0	151.5	47.2		24	0.629	75.1	23.4	104.1
Feb.	5	0.998	4.6	142.7	47.0		29	0.608	77.5	23.2	109.6
	10	0.999	3.5	127.3	46.9	Sept.	3	0.587	80.0	22.9	115.9
	15	1.000	2.4	96.7	46.8		8	0.565	82.5	22.4	122.7
	20	1.000	1.6	47.6	46.8		13	0.542	85.1	21.7	129.9
	25	0.999	2.8	17.8	46.8		18	0.518	87.9	20.8	138.2
Mar.	2	0.998	4.7	2.6	46.9		23	0.494	90.7	19.9	147.1
	7	0.997	6.4	355.1	47.0		28	0.467	93.7	18.8	156.6
	12	0.995	7.9	350.3	47.2	Oct.	2	0.439	97.0	17.7	166.6
	17	0.993	9.5	347.3	47.4		7	0.409	100.5	16.6	177.1
	22	0.990	11.2	345.1	47.6		12	0.377	104.3	15.5	187.9
	27	0.987	13.0	343.9	48.0		17	0.343	108.3	14.4	197.9
Apr.	1	0.984	14.7	343.0	48.4		22	0.306	112.9	13.5	205.9
	6	0.980	16.5	342.7	48.9		27	0.266	117.9	12.8	210.5
	11	0.975	18.3	342.9	49.4	Nov.	2	0.224	123.6	12.4	209.4
	16	0.969	20.2	343.3	49.9		7	0.179	130.0	12.4	197.5
	21	0.963	22.1	344.1	50.5		12	0.132	137.3	12.8	172.6
	26	0.957	24.0	345.4	51.2		17	0.087	145.7	13.9	132.4
May	1	0.950	25.9	346.7	51.9		22	0.047	155.0	15.4	81.4
	6	0.942	27.9	348.4	52.7		24	0.033	159.1	16.6	59.6
	11	0.934	29.9	350.3	53.6		26	0.021	163.3	17.4	39.4
	16	0.925	31.9	352.5	54.5		28	0.012	167.6	18.9	22.4
	21	0.915	33.9	354.8	55.5		30	0.005	172.0	21.6	9.7
	26	0.905	36.0	357.2	56.6	Dec.	2	0.001	176.0	29.9	2.3
	31	0.894	38.0	359.7	57.9		4	0.000	178.8	159.1	0.2
June	5	0.883	40.1	2.2	59.2		6	0.002	174.5	189.0	4.6
	10	0.871	42.2	4.7	60.5		8	0.008	170.0	193.1	14.9
	15	0.858	44.3	7.1	62.0		10	0.015	165.7	194.9	29.8
	20	0.845	46.4	9.4	63.6		12	0.026	161.4	195.9	48.7
	25	0.831	48.5	11.6	65.4		14	0.039	157.3	196.4	69.5
	30	0.817	50.6	13.6	67.3		16	0.053	153.2	196.9	91.9
July	5	0.802	52.8	15.5	69.3		18	0.070	149.4	197.2	113.8
	10	0.787	55.0	17.1	71.6		20	0.087	145.7	197.4	134.2
	15	0.772	57.1	18.6	74.2		22	0.105	142.2	197.3	153.1
	20	0.756	59.3	19.8	76.7		27	0.151	134.2	197.0	188.9
	25	0.739	61.5	20.9	79.6		32	0.198	127.1	196.1	210.0



APPARENT ORBITS OF THE SATELLITES OF MARS DURING THE OPPOSITION OF 1890, AS SEEN IN AN INVERTING TELESCOPE.

The circle represents the disk of the planet and is on the same scale as the orbits. The mean motions of the satellites are not yet (November, 1886, sufficiently well determined to enable the times of greatest elongation to be very accurately predicted.

WASHINGTON MEAN TIME OF GREATEST ELONGATION.

PHOBOS.									DEIMOS.					
	d	h		d	h		d	h		d	h		d	h
May	13	9.5 W.	May	30	3.3 E.	June	15	21.0 W.	May	10	4.7 W.	June	7	13.8 E.
	14	12.3 E.		31	6.0 W.		16	23.8 E.		12	2.1 E.		9	11.2 W.
	15	15.1 W.	June	1	8.8 E.		18	2.6 W.		13	23.5 W.		11	8.6 E.
	16	17.9 E.		2	11.6 W.		19	5.3 E.		15	20.9 E.		13	6.0 W.
	17	20.7 W.		3	14.4 E.		20	8.1 W.		17	18.3 W.		15	3.4 E.
	18	23.4 E.		4	17.2 W.		21	10.9 E.		19	15.7 E.		17	0.8 W.
	20	2.2 W.		5	20.0 E.		22	13.7 W.		21	13.1 W.		18	22.2 E.
	21	5.0 E.		6	22.7 W.		23	16.5 E.		23	10.5 E.		20	19.6 W.
	22	7.8 W.		8	1.5 E.		24	19.3 W.		25	7.9 W.		22	17.1 E.
	23	10.6 E.		9	4.3 W.		25	22.1 E.		27	5.3 E.		24	14.5 W.
	24	13.4 W.		10	7.1 E.		27	0.9 W.		29	2.7 W.		26	11.9 E.
	25	16.1 E.		11	9.9 W.		28	3.6 E.		31	0.2 E.		28	9.4 W.
	26	18.9 W.		12	12.6 E.		29	6.4 W.	June	1	21.5 W.		30	6.8 E.
	27	21.7 E.		13	15.4 W.		30	9.2 E.		3	18.9 E.	July	2	4.3 W.
	29	0.5 W.		14	18.3 E.	July	1	12.0 W.		5	16.4 W.		4	1.7 E.

Date.			Position Angle.	Distance.	Date.			Position Angle.	Distance.
	d	h	°	″		d	h	°	″
May	16	17.9	124.3	25.1	May	15	20.9	123.6	62.4
June	3	14.4	126.1	26.7	June	7	13.8	125.6	66.6
	30	9.2	127.5	24.3		30	6.8	126.6	60.7

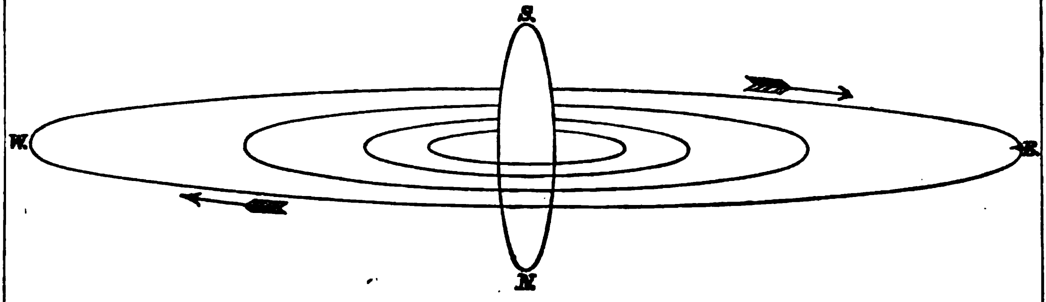
For Phobos every seventh eastern and western elongation is given and for Deimos every third; the intermediate ones may be found by adding the periodic time of each satellite.

Periodic time of Phobos, $0^{d}\ 7^{h}\ 39^{m}\ 13^{s}.937$. Periodic time of Deimos, $1^{d}\ 6^{h}\ 17^{m}\ 54^{s}.377$.

APPARENT DISK OF MARS.

January	1,	0.913	May	31,	0.999	September	28,	0.847
	31,	0.900	June	30,	0.947	October	28,	0.855
March	2,	0.898	July	30,	0.884	November	27,	0.872
April	1,	0.920	August	29,	0.849	December	27,	0.894
May	1,	0.969						

The numbers in this table are the versed sines of the illuminated disk, the apparent diameter of the planet being taken as unity.



APPARENT ORBITS OF THE SATELLITES OF JUPITER IN 1890, AS SEEN IN AN INVERTING TELESCOPE.

(*The vertical scale is six times the horizontal one.*)

The object of this figure is to facilitate the identification of the satellites in cases where the diagrams of configurations do not suffice for that purpose: reference to the above diagram enables one to identify the inner and outer satellite of the pair. The central, vertical ellipse represents the disk of Jupiter, elongated five times in the vertical direction to correspond to the representation of the orbits of the satellites.

Facing each page of the phenomena of Jupiter's satellites, pages 458—479, is the page of diagrams of configurations, for the same month. The light disks ○ in the vertical row in the middle of the page represent the relative position of Jupiter each day. The dots adjacent in the same horizontal space represent the positions of the several satellites on the same day, at the hour and minute of Washington mean time indicated above the diagrams. The latitudes of the satellites are always considered zero in constructing the diagrams, except where two or more satellites chance to be at nearly the same distance from the planet, when they are placed one above the other according to their apparent latitudes. The numerals designating the satellites are placed on the right or left hand side of the dot, according as the motion of the satellite, for the time of the configuration, is toward the east or toward the west—the motion being always toward the numeral. Frequently, at the epoch of the configuration, one or more satellites will be invisible, being projected on the disk of the planet: this phenomenon is indicated by a light disk ○ at the left hand side of the page. Frequently, also, one or more satellites will be invisible, being concealed in occultation behind the disk, or eclipsed in the shadow of the planet: this phenomenon is indicated by a dark disk ● at the right hand side of the page. In both cases, the annexed numeral serves to point out which satellite is thus rendered invisible.

When an observation is made at a different hour from that for which the diagram is constructed, the motion of the satellite during the interval may be judged by transferring its given position to the above diagram, and estimating its motion during the elapsed interval on the above diagram of the orbits, by means of the following table of the periods:—

MEAN SYNODIC PERIODS OF THE SATELLITES.

	d	h	m	s		d
I.	1	18	28	35.945	=	1.76986048
II.	3	13	17	53.735	=	3.55409416
III.	7	3	59	35.854	=	7.16638720
IV.	16	18	5	6.928	=	16.75355241

WASHINGTON MEAN TIMES OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE I.

		h	m			h	m			h	m			h	m
Feb.	5	10	57.8	April	29	16	8.6	July	21	19	22.0	Oct.	12	22	24.2
	7	5	28.1	May	1	10	37.2		23	13	48.2		14	16	52.5
	8	23	58.4		3	5	5.7		25	8	14.0		16	11	21.0
	10	18	28.7		4	23	34.1		27	2	40.0		18	5	49.5
	12	12	58.8		6	18	2.4		28	21	6.0		20	0	18.2
	14	7	29.2		8	12	30.6		30	15	32.0		21	18	46.9
	16	1	59.4		10	6	58.9	Aug.	1	9	58.0		23	13	15.7
	17	20	29.6		12	1	27.1		3	4	24.0		25	7	44.4
	19	14	59.7		13	19	55.2		4	22	50.0		27	2	13.2
	21	9	29.8		15	14	23.1		6	17	16.1		28	20	42.2
	23	3	59.9		17	8	51.1		8	11	42.0		30	15	11.3
	24	22	30.1		19	3	18.9		10	6	8.2	Nov.	1	9	40.3
	26	17	0.1		20	21	46.9		12	0	34.2		3	4	9.4
	28	11	30.2		22	16	14.6		13	19	0.4		4	22	38.5
March	2	6	0.1		24	10	42.2		15	13	26.5		6	17	7.7
	4	0	30.0		26	5	9.8		17	7	52.8		8	11	37.0
	5	19	0.0		27	23	37.4		19	2	19.1		10	6	6.4
	7	13	29.9		29	18	4.9		20	20	45.4		12	0	35.8
	9	7	59.8		31	12	32.4		22	15	11.7		13	19	5.2
	11	2	29.7	June	2	6	59.7		24	9	38.1		15	13	34.6
	12	20	59.4		4	1	27.0		26	4	4.4		17	8	4.1
	14	15	29.2		5	19	54.0		27	22	31.1		19	2	33.7
	16	9	58.9		7	14	21.3		29	16	57.6		20	21	3.5
	18	4	28.7		9	8	48.4		31	11	24.2		22	15	33.1
	19	22	58.3		11	3	15.4	Sept.	2	5	50.8		24	10	2.9
	21	17	28.0		12	21	42.3		4	0	17.6		26	4	32.5
	23	11	57.5		14	16	9.2		5	18	44.4		27	23	2.4
	25	6	27.1		16	10	35.9		7	13	11.2		29	17	32.1
	27	0	56.5		18	5	2.7		9	7	38.2	Dec.	1	12	2.0
	28	19	26.2		19	23	29.5		11	2	5.2		3	6	31.9
	30	13	55.5		21	17	56.2		12	20	32.3		5	1	1.8
April	1	8	25.0		23	12	22.7		14	14	59.5		6	19	31.7
	3	2	54.3		25	6	49.2		16	9	26.7		8	14	1.7
	4	21	23.7		27	1	15.6		18	3	54.1		10	8	31.8
	6	15	53.0		28	19	42.2		19	22	21.5		12	3	2.0
	8	10	22.2		30	14	8.5		21	16	49.0		13	21	32.1
	10	4	51.3	July	2	8	34.9		23	11	16.5		15	16	2.3
	11	23	20.5		4	3	1.1		25	5	44.2		17	10	32.3
	13	17	49.5		5	21	27.4		27	0	11.8		19	5	2.5
	15	12	18.6		7	15	53.6		28	18	39.5		20	23	32.6
	17	6	47.5		9	10	19.8		30	13	7.4		22	18	2.9
	19	1	16.4		11	4	46.0	Oct.	2	7	35.3		24	12	33.2
	20	19	45.2		12	23	12.1		4	2	3.3		26	7	3.5
	22	14	14.0		14	17	38.1		5	20	31.3		28	1	33.7
	24	8	42.7		16	12	4.2		7	14	59.3		29	20	4.0
	26	3	11.5		18	6	30.1		9	9	27.6		31	14	34.3
	27	21	40.0		20	0	56.1		11	3	56.0				

WASHINGTON MEAN TIMES OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE II.

		h m			h m			h m			h m
Feb.	4	2 47.9	April	30	11 29.4	July	24	15 54.4	Oct.	14	6 57.3
	7	16 12.6	May	4	0 45.9		28	5 1.2		17	20 14.8
	11	5 37.2		7	14 2.1		31	18 8.0		21	9 32.2
	14	19 1.9		11	3 17.7	Aug.	4	7 14.9		24	22 51.1
	18	8 26.3		14	16 32.8		7	20 21.8		28	12 9.7
	21	21 50.8		18	5 47.4		11	9 29.0	Nov.	1	1 29.7
	25	11 14.7		21	19 1.5		14	22 36.4		4	14 49.2
March	1	0 38.6		25	8 15.2		18	11 44.1		8	4 10.4
	4	14 1.8		28	21 28.3		22	0 52.3		11	17 31.0
	8	3 24.9	June	1	10 40.9		25	14 0.7		15	6 53.0
	11	16 47.5		4	23 52.9		29	3 9.9		18	20 14.4
	15	6 9.9		8	13 4.4	Sept.	1	16 19.2		22	9 37.4
	18	19 32.0		12	2 15.2		5	5 29.2		25	22 59.8
	22	8 54.1		15	15 25.7		8	18 39.4		29	12 23.5
	25	22 15.5		19	4 35.6		12	7 50.6	Dec.	3	1 46.5
	29	11 36.7		22	17 45.2		15	21 2.0		6	15 11.1
April	2	0 57.4		26	6 54.2		19	10 14.4		10	4 34.7
	5	14 17.7		29	20 2.9		22	23 27.1		13	17 59.8
	9	3 37.8	July	3	9 11.1		26	12 40.8		17	7 24.2
	12	16 57.5		6	22 18.9		30	1 54.7		20	20 49.9
	16	6 16.9		10	11 26.5	Oct.	3	15 9.6		24	10 14.6
	19	19 35.8		14	0 33.8		7	4 24.7		27	23 40.6
	23	8 54.4		17	13 40.9		10	17 41.0		31	13 5.7
	26	22 12.2		21	2 47.7						

SATELLITE III.

		h m			h m			h m			h m
Feb.	3	3 48.8	April	30	7 21.0	July	25	2 21.0	Oct.	18	20 40.4
	10	8 16.9	May	7	11 19.1	Aug.	1	5 37.6		26	0 39.6
	17	12 44.1		14	15 13.3		8	8 54.2	Nov.	2	4 43.2
	24	17 9.8		21	19 3.0		15	12 12.4		9	8 51.3
March	3	21 34.8		28	22 47.6		22	15 32.4		16	13 2.5
	11	1 57.4	June	5	2 27.9		29	18 55.2		23	17 17.4
	18	6 18.4		12	6 3.6	Sept.	5	22 22.0		30	21 34.6
	25	10 36.4		19	9 34.6		13	1 53.1	Dec.	8	1 54.6
April	1	14 51.6		26	13 2.5		20	5 29.5		15	6 17.1
	8	19 3.9	July	3	16 26.4		27	9 10.1		22	10 41.8
	15	23 13.2		10	19 46.7	Oct.	4	12 55.8		29	15 9.1
	23	3 19.5		17	23 4.6		11	16 45.9			

SATELLITE IV.

		h m			h m			h m			h m
Feb.	2	3 13.1	April	27	6 14.8	July	19	14 39.3	Oct.	10	18 52.9
	18	23 52.7	May	14	0 7.1	Aug.	5	4 50.4		27	12 43.2
March	7	20 13.7		30	17 4.7		21	19 12.7	Nov.	13	7 25.5
	24	16 9.6	June	16	9 3.9	Sept.	7	10 11.5		30	2 52.1
April	10	11 33.2	July	3	0 11.2		24	2 2.6	Dec.	16	22 54.5

WASHINGTON MEAN TIME.

The Satellites are invisible from January 1 until February 5, Jupiter being too near the Sun.

FEBRUARY.

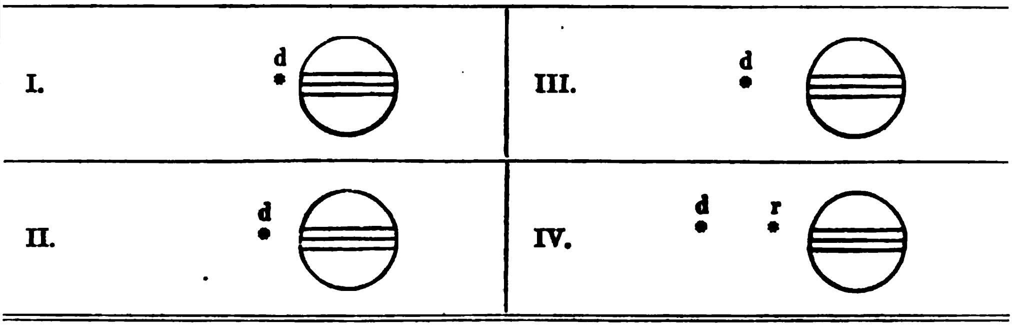
d	h	m	s			
5	9	22	35	I.	Ec.	Dis.
	12	7		I.	Oc.	Re.
	18	37		II.	Sh.	In.
	19	36		II.	Tr.	In.
	21	26		II.	Sh.	Eg.
	22	25		II.	Tr.	Eg.
6	6	41		I.	Sh.	In.
	7	10		I.	Tr.	In.
	9	0		I.	Sh.	Eg.
	9	29		I.	Tr.	Eg.
	14	21		III.	Sh.	In.
	16	19		III.	Tr.	In.
	17	47		III. *	Sh.	Eg.
	19	47		III.	Tr.	Eg.
7	3	51	8	I.	Ec.	Dis.
	6	38		I.	Oc.	Re.
	13	49	36	II.	Ec.	Dis.
	17	37		II. *	Oc.	Re.
8	1	9		I.	Sh.	In.
	1	40		I.	Tr.	In.
	3	28		I.	Sh.	Eg.
	3	59		I.	Tr.	Eg.
	22	19	37	I.	Ec.	Dis.
9	1	8		I.	Oc.	Re.
	7	55		II.	Sh.	In.
	9	0		II.	Tr.	In.
	10	44		II.	Sh.	Eg.
	11	49		II.	Tr.	Eg.
	19	37		I.	Sh.	In.
	20	10		I.	Tr.	In.
	21	56		I.	Sh.	Eg.
	22	29		I.	Tr.	Eg.
10	4	25	3	III.	Ec.	Dis.
	6	55		IV.	Sh.	In.
	10	1		III.	Oc.	Re.
	10	49		IV.	Sh.	Eg.
	11	59		IV.	Tr.	In.
	15	59		IV.	Tr.	Eg.
	16	48	8	I.	Ec.	Dis.
	19	38		I.	Oc.	Re.
11	3	7	11	II.	Ec.	Dis.
	7	2		II.	Oc.	Re.
	14	6		I.	Sh.	In.
	14	40		I.	Tr.	In.
	16	25		I.	Sh.	Eg.
	16	59		I.	Tr.	Eg.
12	11	16	35	I.	Ec.	Dis.
	14	9		I.	Oc.	Re.
	21	13		II.	Sh.	In.
	22	24		II.	Tr.	In.
13	0	2		II.	Sh.	Eg.
	1	13		II.	Tr.	Eg.
13	8	35		I.	Sh.	In.
	9	10		I.	Tr.	In.
	10	54		I.	Sh.	Eg.
	11	29		I.	Tr.	Eg.
	18	21		III. *	Sh.	In.
	20	47		III.	Tr.	In.
	21	47		III.	Sh.	Eg.
14	0	16		III.	Tr.	Eg.
	5	45	7	I.	Ec.	Dis.
	8	39		I.	Oc.	Re.
	16	25	8	II.	Ec.	Dis.
	20	27		II.	Oc.	Re.
15	3	4		I.	Sh.	In.
	3	41		I.	Tr.	In.
	5	23		I.	Sh.	Eg.
	6	0		I.	Tr.	Eg.
16	0	13	35	I.	Ec.	Dis.
	3	9		I.	Oc.	Re.
	10	31		II.	Sh.	In.
	11	49		II.	Tr.	In.
	13	20		II.	Sh.	Eg.
	14	38		II.	Tr.	Eg.
	21	32		I.	Sh.	In.
	22	11		I.	Tr.	In.
	23	51		I.	Sh.	Eg.
17	0	30		I.	Tr.	Eg.
	8	23	47	III.	Ec.	Dis.
	14	29		III.	Oc.	Re.
	18	42	6	I. *	Ec.	Dis.
	21	39		I.	Oc.	Re.
18	5	42	39	II.	Ec.	Dis.
	9	51		II.	Oc.	Re.
	15	32	57	IV.	Ec.	Dis.
	16	0		I.	Sh.	In.
	16	41		I.	Tr.	In.
	18	19		I. *	Sh.	Eg.
	19	0		I. *	Tr.	Eg.
	19	23	15	IV. *	Ec.	Re.
	21	49		IV.	Oc.	Dis.
19	1	56		IV.	Oc.	Re.
	13	10	33	I.	Ec.	Dis.
	16	9		I.	Oc.	Re.
	23	49		II.	Sh.	In.
20	1	13		II.	Tr.	In.
	2	38		II.	Sh.	Eg.
	4	2		II.	Tr.	Eg.
	10	29		I.	Sh.	In.
	11	12		I.	Tr.	In.
	12	48		I.	Sh.	Eg.
	13	32		I.	Tr.	Eg.
	22	20		III.	Sh.	In.
21	1	13		III.	Tr.	In.
21	1	47		III.	Sh.	Eg.
	4	44		III.	Tr.	Eg.
	7	39	5	I.	Ec.	Dis.
	10	40		I.	Oc.	Re.
	19	0	28	II. *	Ec.	Dis.
	23	16		II.	Oc.	Re.
22	4	58		I.	Sh.	In.
	5	42		I.	Tr.	In.
	7	17		I.	Sh.	Eg.
	8	1		I.	Tr.	Eg.
23	2	7	32	I.	Ec.	Dis.
	5	10		I.	Oc.	Re.
	13	7		II.	Sh.	In.
	14	37		II.	Tr.	In.
	15	56		II.	Sh.	Eg.
	17	26		II.	Tr.	Eg.
	23	27		I.	Sh.	In.
24	0	12		I.	Tr.	In.
	1	46		I.	Sh.	Eg.
	2	32		I.	Tr.	Eg.
	12	22	39	III.	Ec.	Dis.
	18	55		III. *	Oc.	Re.
	20	36	2	I.	Ec.	Dis.
	23	40		I.	Oc.	Re.
25	8	17	54	II.	Ec.	Dis.
	12	40		II.	Oc.	Re.
	17	55		I. *	Sh.	In.
	18	42		I. *	Tr.	In.
	20	14		I.	Sh.	Eg.
	21	1		I.	Tr.	Eg.
26	15	4	27	I.	Ec.	Dis.
	18	10		I. *	Oc.	Re.
27	0	59		IV.	Sh.	In.
	2	24		II.	Sh.	In.
	4	1		II.	Tr.	In.
	5	0		IV.	Sh.	Eg.
	5	13		II.	Sh.	Eg.
	6	51		II.	Tr.	Eg.
	8	26		IV.	Tr.	In.
	12	23		I.	Sh.	In.
	12	39		IV.	Tr.	Eg.
	13	12		I.	Tr.	In.
	14	42		I.	Sh.	Eg.
	15	32		I.	Tr.	Eg.
28	2	19		III.	Sh.	In.
	5	38		III.	Tr.	In.
	5	47		III.	Sh.	Eg.
	9	9		III.	Tr.	Eg.
	9	32	59	I.	Ec.	Dis.
	12	40		I.	Oc.	Re.
	21	35	35	II.	Ec.	Dis.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse. Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

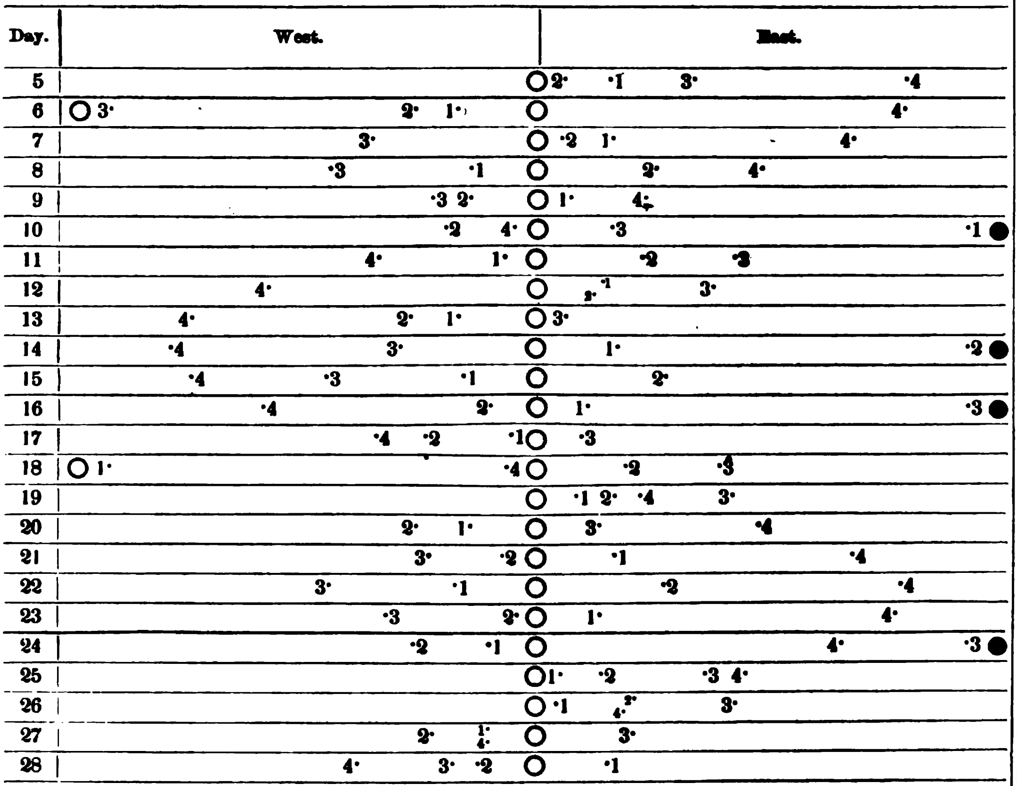
WASHINGTON MEAN TIME.

FEBRUARY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 18h 30m for an Inverting Telescope.



WASHINGTON MEAN TIME.

MARCH.

d	h	m	s			
1	2	4		II.	Oc.	Re.
	6	52		I.	Sh.	In.
	7	42		I.	Tr.	In.
	9	11		I.	Sh.	Eg.
	10	1		I.	Tr.	Eg.
2	4	1	25.9	I.	Ec.	Dis.
	7	10		I.	Oc.	Re.
	15	42		II.*	Sh.	In.
	17	24		II.*	Tr.	In.
	18	32		II.	Sh.	Eg.
	20	16		II.	Tr.	Eg.
3	1	20		I.	Sh.	In.
	2	11		I.	Tr.	In.
	3	39		I.	Sh.	Eg.
	4	31		I.	Tr.	Eg.
	16	22	5.9	III.*	Ec.	Dis.
	19	41	13.1	III.	Ec.	Re.
	19	49		III.	Oc.	Dis
	22	29	58.8	I.	Ec.	Dis.
	23	21		III.	Oc.	Re.
4	1	40		I.	Oc.	Re.
	10	52	56.7	II.	Ec.	Dis.
	15	27		II.	Oc.	Re.
	19	48		I.	Sh.	In.
	20	41		I.	Tr.	In.
	22	7		I.	Sh.	Eg.
	23	1		I.	Tr.	Eg.
5	16	58	20.6	I.*	Ec.	Dis.
	20	10		I.	Oc.	Re.
6	5	0		II.	Sh.	In.
	6	48		II.	Tr.	In.
	7	50		II.	Sh.	Eg.
	9	40		II.	Tr.	Eg.
	14	17		I.	Sh.	In.
	15	11		I.	Tr.	In.
	16	36		I.*	Sh.	Eg.
	17	31		I.*	Tr.	Eg.
7	6	18		III.	Sh.	In.
	9	34	18.6	IV.	Ec.	Dis.
	9	46		III.	Sh.	Eg.
	10	0		III.	Tr.	In.
	11	26	52.2	I.	Ec.	Dis.
	13	30	43.2	IV.	Ec.	Re.
	13	33		III.	Tr.	Eg.
	14	40		I.	Oc.	Re.
	18	5		IV.*	Oc.	Dis.
	22	22		IV.	Oc.	Re.
8	0	10	29.3	II.	Ec.	Dis.
	4	50		II.	Oc.	Re.
	8	45		I.	Sh.	In.
	9	41		I.	Tr.	In.
	11	4		I.	Sh.	Eg.
	12	1		I.	Tr.	Eg.
9	5	55	18.0	I.	Ec.	Dis.
	9	10		I.	Oc.	Re.
	18	18		II.*	Sh.	In.
	20	12		II.	Tr.	In.
	21	8		II.	Sh.	Eg.
	23	4		II.	Tr.	Eg.
10	3	14		I.	Sh.	In.
	4	11		I.	Tr.	In.
	5	33		I.	Sh.	Eg.
	6	31		I.	Tr.	Eg.
	20	21	6.9	III.	Ec.	Dis.
	23	40	57.9	III.	Ec.	Re.
11	0	11		III.	Oc.	Dis.
	0	23	47.8	I.	Ec.	Dis.
	3	40		I.	Oc.	Re.
11	3	44		III.	Oc.	Re.
	13	27	47.1	II.	Ec.	Dis.
	18	13		II.*	Oc.	Re.
	21	42		I.	Sh.	In.
	22	41		I.	Tr.	In.
12	0	1		I.	Sh.	Eg.
	1	1		I.	Tr.	Eg.
	18	52	12.2	I.	Ec.	Dis.
	22	9		I.	Oc.	Re.
13	7	36		II.	Sh.	In.
	9	35		II.	Tr.	In.
	10	26		II.	Sh.	Eg.
	12	27		II.	Tr.	Eg.
	16	11		I.*	Sh.	In.
	17	10		I.*	Tr.	In.
	18	30		I.	Sh.	Eg.
	19	30		I.	Tr.	Eg.
14	10	17		III.	Sh.	In.
	13	20	43.3	I.	Ec.	Dis.
	13	46		III.	Sh.	Eg.
	14	22		III.	Tr.	In.
	16	39		I.*	Oc.	Re.
	17	56		III.*	Tr.	Eg.
15	2	45	12.1	II.	Ec.	Dis.
	7	36		II.	Oc.	Re.
	10	39		I.	Sh.	In.
	11	40		I.	Tr.	In.
	12	58		I.	Sh.	Eg.
	14	0		I.	Tr.	Eg.
	19	2		IV.	Sh.	In.
	23	10		IV.	Sh.	Eg.
16	4	31		IV.	Tr.	In.
	7	49	8.8	I.	Ec.	Dis.
	8	54		IV.	Tr.	Eg.
	11	9		I.	Oc.	Re.
	20	54		II.	Sh.	In.
	22	58		II.	Tr.	In.
	23	44		II.	Sh.	Eg.
17	1	50		II.	Tr.	Eg.
	5	8		I.	Sh.	In.
	6	9		I.	Tr.	In.
	7	27		I.	Sh.	Eg.
	8	29		I.	Tr.	Eg.
18	0	20	26.0	III.	Ec.	Dis
	2	17	38.4	I.	Ec.	Dis.
	3	40	50.0	III.	Ec.	Re.
	4	31		III.	Oc.	Dis.
	5	39		I.	Oc.	Re.
	8	6		III.	Oc.	Re.
	16	2	25.7	II.*	Ec.	Dis.
	20	58		II.	Oc.	Re.
	23	36		I.	Sh.	In.
19	0	39		I.	Tr.	In.
	1	55		I.	Sh.	Eg.
	2	59		I.	Tr.	Eg.
	20	46	2.4	I.	Ec.	Dis.
20	0	8		I.	Oc.	Re.
	10	12		II.	Sh.	In.
	12	21		II.	Tr.	In.
	13	2		II.	Sh.	Eg.
	15	13		II.	Tr.	Eg.
	18	4		I.*	Sh.	In.
	19	8		I.	Tr.	In.
	20	23		I.	Sh.	Eg.
	21	28		I.	Tr.	Eg.
21	14	15		III.	Sh.	In.
	15	14	33.4	I.	Ec.	Dis.
	17	45		III.*	Sh.	Eg.
21	18	38		I.	Oc.	Re.
	18	40		III.	Tr.	In.
	22	15		III.	Tr.	Eg.
22	5	19	44.0	II.	Ec.	Dis.
	10	20		II.	Oc.	Re.
	12	32		I.	Sh.	In.
	13	38		I.	Tr.	In.
	14	51		I.	Sh.	Eg.
	15	58		I.*	Tr.	Eg.
23	9	42	58.8	I.	Ec.	Dis.
	13	7		I.	Oc.	Re.
	23	30		II.	Sh.	In.
24	1	43		II.	Tr.	In.
	2	20		II.	Sh.	Eg.
	3	35	39.1	IV.	Ec.	Dis.
	4	35		II.	Tr.	Eg.
	7	0		I.	Sh.	In.
	7	37	45.1	IV.	Ec.	Re.
	8	8		I.	Tr.	In.
	9	19		I.	Sh.	Eg.
	10	28		I.	Tr.	Eg.
	13	56		IV.	Oc.	Dis.
	18	23		IV.	Oc.	Re.
25	4	11	28.3	I.	Ec.	Dis.
	4	19	9.4	III.	Ec.	Dis.
	6	37		I.	Oc.	Re.
	7	40	25.2	III.	Ec.	Re.
	8	48		III.	Oc.	Dis.
	12	24		III.	Oc.	Re.
	18	36	53.8	II.	Ec.	Dis.
	23	42		II.	Oc.	Re.
26	1	29		I.	Sh.	In.
	2	38		I.	Tr.	In.
	3	48		I.	Sh.	Eg.
	4	58		I.	Tr.	Eg.
	22	39	51.8	I.	Ec.	Dis.
27	1	6		I.	Oc.	Re.
	12	48		II.	Sh.	In.
	15	5		II.	Tr.	In.
	15	38		II.	Sh.	Eg.
	17	57		II.*	Tr.	Eg.
	19	57		I.	Sh.	In.
	21	7		I.	Tr.	In.
	22	16		I.	Sh.	Eg.
	23	27		I.	Tr.	Eg
28	17	8	22.7	I.*	Ec.	Dis.
	18	14		III.*	Sh.	In.
	20	36		I.	Oc.	Re.
	21	45		III.	Sh.	Eg.
	22	56		III.	Tr.	In.
29	2	32		III.	Tr.	Eg.
	7	54	5.7	II.	Ec.	Dis.
	13	3		II.	Oc.	Re.
	14	25		I.	Sh.	In.
	15	36		I.	Tr.	In.
	16	44		I.*	Sh.	Eg.
	17	56		I.*	Tr.	Eg.
30	11	36	47.8	I.	Ec.	Dis.
	15	5		I.	Oc.	Re.
31	2	6		II.	Sh.	In.
	4	27		II.	Tr.	In.
	4	56		II.	Sh.	Eg.
	7	19		II.	Tr.	Eg.
	8	54		I.	Sh.	In.
	10	6		I.	Tr.	In.
	11	13		I.	Sh.	Eg.
	12	26		I.	Tr.	Eg.

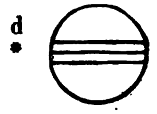
NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

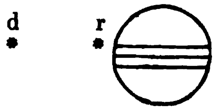
MARCH.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

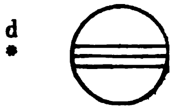
I.



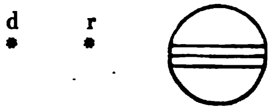
III.



II.



IV.



Configurations at 17ʰ for an Inverting Telescope.

Day.	West.		East.
1	4· 3· 1·	O	·2
2	4· ·3	O	2· 1·
3	·4 ·2 ·1 ·3	O	
4	·4	O	·2 1· ·3
5	·4 ·1	O	2· 3·
6	O 1· ·4 2·	O	3·
7	·2 3· ·4	O	·1
8	3· 1·	O	·2 ·4
9	·3	O	2· ·1 ·4
10	2· ·1 ·3	O	·4
11		O	1· ·3 ·4 ·2 ●
12	·1	O	2· ·3 4·
13	2·	O	1· 3· 4·
14	O 3· ·2	O	·1 4· ·1 ●
15	3· 1·	O	4· ·2
16	·3 4·	O	2· ·1
17	4· 2· 3· 1·	O	
18	4· ·2	O	1· 3
19	4· ·1	O	2· ·3
20	·4 2·	O	1· 3·
21	·4 ·2	O	3· ·1 ●
22	·4 3· 1·	O	·2
23	·3 ·4	O	·1 2·
24	3 2 1·	O	·4 ●
25	·2	O	·3 ·1 ·4
26	·1	O	·2 ·3 ·4
27	O 2·	O	1· 3· ·4
28	·2 ·1	O	3· ·4
29	O 1· 3·	O	·2 4·
30	3·	O	·1 2· 4·
31	·3 2· 1·	O	4·

WASHINGTON MEAN TIME.

APRIL.

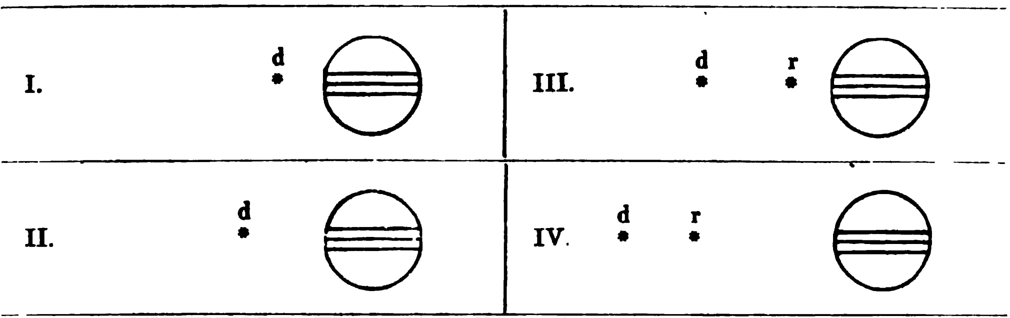
d	h	m	s			
1	6	5	17.1	I.	Ec.	Dis.
	8	17	44.9	III.	Ec.	Dis.
	9	35		I.	Oc.	Re.
	11	39	41.3	III.	Ec.	Re.
	13	3		III.	Oc.	Dis.
	13	6		IV.	Sh.	In.
	16	40		III.*	Oc.	Re.
	17	20		IV.*	Sh.	Eg.
	21	11	11.6	II.	Ec.	Dis.
2	0	10		IV.	Tr.	In.
	2	24		II.	Oc.	Re.
	3	22		I.	Sh.	In.
	4	35		I.	Tr.	In.
	4	41		IV.	Tr.	Eg.
	5	41		I.	Sh.	Eg.
	6	55		I.	Tr.	Eg.
3	0	33	40.5	I.	Ec.	Dis.
	4	4		I.	Oc.	Re.
	15	24		II.*	Sh.	In.
	17	48		II.	Tr.	In.
	18	14		II.	Sh.	Eg.
	20	40		II.	Tr.	Eg.
	21	50		I.	Sh.	In.
	23	4		I.	Tr.	In.
4	0	9		I.	Sh.	Eg.
	1	24		I.	Tr.	Eg.
	19	2	11.4	I.	Ec.	Dis.
	22	13		III.	Sh.	In.
	22	34		I.	Oc.	Re.
5	1	45		III.	Sh.	Eg.
	3	10		III.	Tr.	In.
	6	47		III.	Tr.	Eg.
	10	28	18.0	II.	Ec.	Dis.
	15	44		II.*	Oc.	Re.
	16	19		I.*	Sh.	In.
	17	33		I.	Tr.	In.
	18	39		I.	Sh.	Eg.
	19	53		I.	Tr.	Eg.
6	13	30	36.1	I.	Ec.	Dis.
	17	3		I.	Oc.	Re.
7	4	42		II.	Sh.	In.
	7	9		II.	Tr.	In.
	7	32		II.	Sh.	Eg.
	10	1		II.	Tr.	Eg.
	10	47		I.	Sh.	In.
	12	2		I.	Tr.	In.
	13	7		I.	Sh.	Eg.
	14	22		I.	Tr.	Eg.
8	7	59	5.4	I.	Ec.	Dis.
	11	32		I.	Oc.	Re.
	12	16	24.7	III.	Ec.	Dis.
	15	39	0.5	III.*	Ec.	Re.
	17	15		III.*	Oc.	Dis.
	20	52		III.	Oc.	Re.
	23	45	20.6	II.	Ec.	Dis.
9	5	4		II.	Oc.	Re.
	5	15		I.	Sh.	In.
	6	31		I.	Tr.	In.
	7	35		I.	Sh.	Eg.
	8	51		I.	Tr.	Eg.
	21	37	45.5	IV.	Ec.	Dis.
10	1	45	10.9	IV.	Ec.	Re.
	2	27	28.3	I.	Ec.	Dis.
	6	1		I.	Oc.	Re.
	9	16		IV.	Oc.	Dis.
	13	50		IV.	Oc.	Re.
	18	0		II.	Sh.	In.
	20	30		II.	Tr.	In
10	20	51		II.	Sh.	Eg.
	23	22		II.	Tr.	Eg.
	23	44		I.	Sh.	In.
11	1	0		I.	Tr.	In.
	2	4		I.	Sh.	Eg.
	3	20		I.	Tr.	Eg.
	20	55	59.1	I.	Ec.	Dis.
12	0	31		I.	Oc.	Re.
	2	12		III.	Sh.	In.
	5	44		III.	Sh.	Eg.
	7	20		III.	Tr.	In.
	10	58		III.	Tr.	Eg.
	13	2	22.1	II.	Ec.	Dis.
	18	12		I.	Sh.	In.
	18	24		II.	Oc.	Re.
	19	29		I.	Tr.	In.
	20	32		I.	Sh.	Eg.
	21	49		I.	Tr.	Eg.
13	15	24	24.0	I.*	Ec.	Dis.
	19	0		I.	Oc.	Re.
14	7	18		II.	Sh.	In.
	9	51		II.	Tr.	In.
	10	9		II.	Sh.	Eg.
	12	40		I.	Sh.	In.
	12	44		II.	Tr.	Eg.
	13	58		I.	Tr.	In.
	15	0		I.*	Sh.	Eg.
	16	18		I.*	Tr.	Eg.
15	9	52	53.5	I.	Ec.	Dis.
	13	29		I.	Oc.	Re.
	16	15	12.7	III.*	Ec.	Dis.
	19	38	27.5	III.	Ec.	Re.
	21	24		III.	Oc.	Dis.
16	1	2		III.	Oc.	Re.
	2	19	21.3	II.	Ec.	Dis.
	7	9		I.	Sh.	In.
	7	43		II.	Oc.	Re.
	8	27		I.	Tr.	In.
	9	29		I.	Sh.	Eg.
	10	47		I.	Tr.	Eg.
17	4	21	16.7	I.	Ec.	Dis.
	7	59		I.	Oc.	Re.
	20	36		II.	Sh.	In.
	23	11		II.	Tr.	In.
	23	27		II.	Sh.	Eg.
18	1	37		I.	Sh.	In.
	2	4		II.	Tr.	Eg.
	2	56		I.	Tr.	In.
	3	57		I.	Sh.	Eg.
	5	16		I.	Tr.	Eg.
	7	11		IV.	Sh.	In.
	11	30		IV.	Sh.	Eg.
	19	12		IV.	Tr.	In.
	22	49	47.5	I.	Ec.	Dis.
	23	50		IV.	Tr.	Eg.
19	2	26		I.	Oc.	Re.
	6	11		III.	Sh.	In.
	9	44		III.	Sh.	Eg.
	11	28		III.	Tr.	In.
	15	6		III.*	Tr.	Eg.
	15	36	18.7	II.	Ec.	Dis.
	20	5		I.	Sh.	In.
	21	2		II.	Oc.	Re.
	21	25		I.	Tr.	In.
	22	25		I.	Sh.	Eg.
	23	45		I.	Tr.	Eg.
20	17	18	12.6	I.*	Ec.	Dis.
	20	55		I.	Oc.	Re.
21	9	54		II.	Sh.	In.
	12	31		II.	Tr.	In.
	12	45		II.	Sh.	Eg.
	14	34		I.	Sh.	In.
	15	24		II.*	Tr.	Eg.
	15	54		I.*	Tr.	In.
	16	54		I.*	Sh.	Eg.
	18	14		I.	Tr.	Eg.
22	11	46	42.5	I.	Ec.	Dis.
	15	24		I.*	Oc.	Re.
	20	14	39.2	III.	Ec.	Dis.
	23	38	31.6	III.	Ec.	Re.
23	1	30		III.	Oc.	Dis.
	4	53	15.5	II.	Ec.	Dis.
	5	9		III.	Oc.	Re.
	9	2		I.	Sh.	In.
	10	21		II.	Oc.	Re.
	10	22		I.	Tr.	In.
	11	22		I.	Sh.	Eg.
	12	42		I.	Tr.	Eg.
24	6	15	5.6	I.	Ec.	Dis.
	9	53		I.	Oc.	Re.
	23	13		II.	Sh.	In.
25	1	51		II.	Tr.	In.
	2	4		II.	Sh.	Eg.
	3	30		I.	Sh.	In.
	4	44		II.	Tr.	Eg.
	4	51		I.	Tr.	In.
	5	50		I.	Sh.	Eg.
	7	11		I.	Tr.	Eg.
26	0	43	36.5	I.	Ec.	Dis.
	4	22		I.	Oc.	Re.
	10	9		III.	Sh.	In.
	13	43		III.	Sh.	Eg.
	15	30		III.*	Tr.	In.
	15	39	32.7	IV.*	Ec.	Dis.
	18	10	9.5	II.	Ec.	Dis.
	19	9		III.	Tr.	Eg.
	19	51	56.1	IV.	Ec.	Re.
	21	59		I.	Sh.	In.
	23	20		I.	Tr.	In.
	23	39		II.	Oc.	Re.
27	0	19		I.	Sh.	Eg.
	1	40		I.	Tr.	Eg.
	3	55		IV.	Oc.	Dis.
	8	35		IV.	Oc.	Re.
	19	12	1.6	I.	Ec.	Dis.
	22	50		I.	Oc.	Re.
28	12	31		II.	Sh.	In.
	15	9		II.*	Tr.	In.
	15	22		II.*	Sh.	Eg.
	16	27		I.*	Sh.	In.
	17	48		I.	Tr.	In.
	18	2		II.	Tr.	Eg.
	18	47		I.	Sh.	Eg.
	20	8		I.	Tr.	Eg.
29	13	40	32.1	I.	Ec.	Dis.
	17	19		I.*	Oc.	Re.
30	0	13	42.4	III.	Ec.	Dis.
	3	38	10.8	III.	Ec.	Re.
	5	31		III.	Oc.	Dis.
	7	27	4.0	II.	Ec.	Dis.
	9	11		III.	Oc.	Re.
	10	55		I.	Sh.	In.
	12	16		I.	Tr.	In.
	12	56		II.	Oc.	Re.
	13	15		I.	Sh.	Eg.
	14	36		I.	Tr.	Eg.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

APRIL.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 16h for an Inverting Telescope.

Day.	West.		East.
1	·2	○	4· ·1 ·3 ●
2	1· 4·	○	·2 ·3
3	4·	○	2· 1· 3·
4	4· 2· ·1	○	3·
5	4· 3·	○	·2 1·
6	·4 3·	○	2· ·1 ●
7	·4 ·3 2· 1·	○	
8	·4 ·2 ·3	○	·1
9	·4 1·	○	·2 ·3
10		○	·4 2· 1· 3·
11	2· ·1	○	3· ·4
12	3·	○	1· ·4 ·2 ●
13	3· ·1	○	2· ·4
14	○ 1· ·3 2·	○	·4
15	·2 ·3	○	·1 4·
16	1·	○	·2 ·3 4·
17		○	2· ·1 4· ·3
18	2· ·1	○	4· 3·
19	4· ·2 3·	○	1·
20	4· 3· ·1	○	·2
21	○ 1· 4· ·3 2·	○	
22	4· ·2 ·3	○	·1
23	·4 1·	○	·2 ·3
24	·4	○	·12· ·3
25	·4 2· 1·	○	3·
26	○ 3· ·4 ·2	○	1·
27	3· ·1	○	·4 ·2
28	○ 2· ·3	○	1· ·4
29	·2 ·3	○	·4 ·1 ●
30	1·	○	·2 ·3 ·4

WASHINGTON MEAN TIME.

MAY.

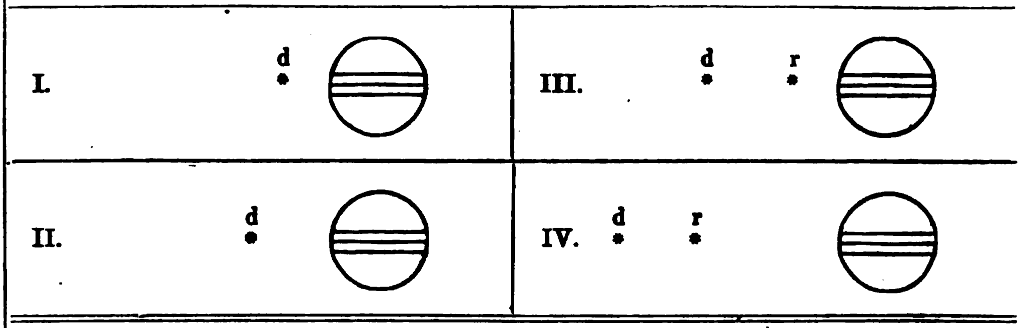
d	h	m	s			
1	8	8	55.5	I.	Ec.	Dis.
	11	47		I.	Oc.	Re.
2	1	49		II.	Sh.	In.
	4	27		II.	Tr.	In.
	4	40		II.	Sh.	Eg.
	5	24		I.	Sh.	In.
	6	44		I.	Tr.	In.
	7	21		II.	Tr.	Eg.
	7	44		I.	Sh.	Eg.
	9	4		I.	Tr.	Eg.
3	2	37	26.7	I.	Ec.	Dis.
	6	16		I.	Oc.	Re.
	14	8		III. *	Sh.	In.
	17	42		III.	Sh.	Eg.
	19	29		III.	Tr.	In.
	20	43	55.7	II.	Ec.	Dis.
	23	9		III.	Tr.	Eg.
	23	52		I.	Sh.	In.
4	1	12		I.	Tr.	In.
	2	12		I.	Sh.	Eg.
	2	13		II.	Oc.	Re.
	3	32		I.	Tr.	Eg.
	21	5	52.2	I.	Ec.	Dis.
5	0	44		I.	Oc.	Re.
	1	15		IV.	Sh.	In.
	5	39		IV.	Sh.	Eg.
	13	29		IV. *	Tr.	In.
	15	7		II. *	Sh.	In.
	17	45		II.	Tr.	In.
	17	58		II.	Sh.	Eg.
	18	12		IV.	Tr.	Eg.
	18	21		I.	Sh.	In.
	19	41		I.	Tr.	In.
	20	39		II.	Tr.	Eg.
	20	41		I.	Sh.	Eg.
	22	1		I.	Tr.	Eg.
6	15	34	23.0	I. *	Ec.	Dis.
	19	13		I.	Oc.	Re.
7	4	13	5.0	III.	Ec.	Dis.
	7	38	8.2	III.	Ec.	Re.
	9	29		III.	Oc.	Dis.
	10	0	48.6	II.	Ec.	Dis.
	12	49		I. *	Sh.	In.
	13	9		III. *	Oc.	Re.
	14	9		I. *	Tr.	In.
	15	10		I. *	Sh.	Eg.
	15	29		II. *	Oc.	Re.
	16	29		I.	Tr.	Eg.
8	10	2	47.0	I.	Ec.	Dis.
	13	41		I. *	Oc.	Re.
9	4	26		II.	Sh.	In.
	7	3		II.	Tr.	In.
	7	17		II.	Sh.	Eg.
	7	17		I.	Sh.	In.
	8	37		I.	Tr.	In.
	9	37		I.	Sh.	Eg.
	9	57		II.	Tr.	Eg.
	10	57		I.	Tr.	Eg.
10	4	31	18.6	I.	Ec.	Dis.
	8	9		I.	Oc.	Re.
	18	6		III.	Sh.	In.
	21	41		III.	Sh.	Eg.
	23	17	38.8	II.	Ec.	Dis.
	23	25		III.	Tr.	In.
11	1	46		I.	Sh.	In.
	3	5		III.	Tr.	Eg.
	3	5		I.	Tr.	In.
	4	6		I.	Sh.	Eg
11	4	45		II.	Oc.	Re.
	5	25		I.	Tr.	Eg.
	22	59	44.6	I.	Ec.	Dis.
12	2	37		I.	Oc.	Re.
	17	44		II.	Sh.	In.
	20	14		I.	Sh.	In.
	20	20		II.	Tr.	In.
	20	36		II.	Sh.	Eg.
	21	33		I.	Tr.	In.
	22	34		I.	Sh.	Eg.
	23	14		II.	Tr.	Eg.
	23	53		I.	Tr.	Eg.
13	9	41	45.0	IV.	Ec.	Dis.
	13	58	42.4	IV. *	Ec.	Re.
	17	28	15.9	I.	Ec.	Dis.
	21	5		I.	Oc.	Re.
	21	44		IV.	Oc.	Dis.
14	2	29		IV.	Oc.	Re.
	8	11	55.9	III.	Ec.	Dis.
	11	37	33.7	III.	Ec.	Re.
	12	34	30.4	II.	Ec.	Dis.
	13	23		III. *	Oc.	Dis.
	14	42		I. *	Sh.	In.
	16	1		I. *	Tr.	In.
	17	2		I.	Sh.	Eg.
	17	3		III.	Oc.	Re.
	18	0		II.	Oc.	Re.
	18	21		I.	Tr.	Eg.
15	11	56	40.0	I.	Ec.	Dis.
	15	33		I. *	Oc.	Re.
16	7	2		II.	Sh.	In.
	9	11		I.	Sh.	In.
	9	36		II.	Tr.	In.
	9	54		II.	Sh.	Eg.
	10	29		I.	Tr.	In.
	11	31		I.	Sh.	Eg.
	12	30		II.	Tr.	Eg.
	12	49		I. *	Tr.	Eg.
17	6	25	12.4	I.	Ec.	Dis.
	10	1		I.	Oc.	Re.
	22	4		III.	Sh.	In.
18	1	39		III.	Sh.	Eg.
	1	51	19.6	II.	Ec.	Dis.
	3	16		III.	Tr.	In.
	3	39		I.	Sh.	In.
	4	57		I.	Tr.	In.
	5	59		I.	Sh.	Eg.
	6	56		III.	Tr.	Eg.
	7	15		II.	Oc.	Re.
	7	17		I.	Tr.	Eg.
19	0	53	36.8	I.	Ec.	Dis.
	4	30		I.	Oc.	Re.
	20	20		II.	Sh.	In.
	22	7		I.	Sh.	In.
	22	52		II.	Tr.	In.
	23	12		II.	Sh.	Eg.
	23	25		I.	Tr.	In.
20	0	27		I.	Sh.	Eg.
	1	44		I.	Tr.	Eg.
	1	46		II.	Tr.	Eg.
	19	22	11.0	I.	Ec.	Dis.
	22	57		I.	Oc.	Re.
21	12	10	42.9	III.	Ec.	Dis.
	15	8	11.2	II. *	Ec.	Dis.
	15	36	54.1	III. *	Ec.	Re.
	16	36		I.	Sh.	In.
	17	13		III.	Oc.	Dis.
	17	53		I.	Tr.	In.
21	18	56		I.	Sh.	Eg.
	19	21		IV.	Sh.	In.
	20	13		I.	Tr.	Eg.
	20	29		II.	Oc.	Re.
	20	53		III.	Oc.	Re.
	23	49		IV.	Sh.	Eg.
22	6	54		IV.	Tr.	In.
	11	41		IV.	Tr.	Eg.
	13	50	35.7	I. *	Ec.	Dis.
	17	25		I.	Oc.	Re.
23	9	39		II.	Sh.	In.
	11	4		I.	Sh.	In.
	12	7		II.	Tr.	In.
	12	20		I.	Tr.	In.
	12	31		II.	Sh.	Eg.
	13	24		I. *	Sh.	Eg.
	14	40		I. *	Tr.	Eg.
	15	1		II. *	Tr.	Eg.
24	8	19	8.6	I.	Ec.	Dis.
	11	52		I.	Oc.	Re.
25	2	5		III.	Sh.	In.
	4	25	1.2	II.	Ec.	Dis.
	5	32		I.	Sh.	In.
	5	40		III.	Sh.	Eg.
	6	47		I.	Tr.	In.
	7	4		III.	Tr.	In.
	7	52		I.	Sh.	Eg.
	9	7		I.	Tr.	Eg.
	9	42		II.	Oc.	Re.
	10	45		III.	Tr.	Eg.
26	2	47	35.9	I.	Ec.	Dis.
	6	20		I.	Oc.	Re.
	22	57		II.	Sh.	In.
27	0	1		I.	Sh.	In.
	1	14		I.	Tr.	In.
	1	22		II.	Tr.	In.
	1	49		II.	Sh.	Eg.
	2	21		I.	Sh.	Eg.
	3	34		I.	Tr.	Eg
	4	17		II.	Tr.	Eg.
	21	16	9.0	I.	Ec.	Dis.
28	0	47		I.	Oc.	Re.
	16	9	40.8	III. *	Ec.	Dis.
	17	41	52.4	II.	Ec.	Dis.
	18	29		I.	Sh.	In.
	19	36	23.6	III.	Ec.	Re.
	19	41		I.	Tr.	In.
	20	49		I.	Sh.	Eg.
	20	52		III.	Oc.	Dis.
	22	1		I.	Tr.	Eg.
	22	56		II.	Oc.	Re.
29	0	38		III.	Oc.	Re.
	15	44	34.4	I. *	Ec.	Dis.
	19	15		I.	Oc.	Re.
30	3	45	0.8	IV.	Ec.	Dis.
	8	6	10.2	IV.	Ec.	Re.
	12	16		II.	Sh.	In.
	12	57		I.	Sh.	In.
	14	9		I. *	Tr.	In.
	14	36		II. *	Tr.	In.
	14	41		IV. *	Oc.	Dis.
	15	9		II. *	Sh.	Eg.
	15	17		I. *	Sh.	Eg.
	16	29		I.	Tr.	Eg.
	17	31		II.	Tr.	Eg.
	19	28		IV.	Oc.	Re.
31	10	13	8.1	I.	Ec.	Dis.
	13	42		I. *	Oc.	Re.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

MAY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 14ʰ 30ᵐ for an Inverting Telescope.

Day.	West.		East.
1		○	·1 2· ·3 4·
2	1· 2·	○	3· 4·
3	·2	○	3· ·1 4·
4	3· ·1	○	·2 4·
5	○ 4· 3·	○	2· 1·
6	·3 2· 4· ·1	○	
7	○ 1· 4·	○	·3 ·2 ●
8	4·	○	·1 2· ·3
9	4· 1· 2·	○	3·
10	·4 ·2	○	·1 3·
11	·4 1· 3·	○	·2
12	3· ·4	○	2· 1·
13	·3 2· ·4 ·1	○	
14	·2	○	1· ·4 ·3 ●
15		○	2· ·3 ·4 ·1 ●
16	1· 2·	○	3· ·4
17	·2	○	·1 3· ·4
18	1· 3·	○	·2 4·
19	3·	○	1· 2· 4·
20	·3 2· ·1	○	4·
21	·3 ·2	○	1· 4·
22	4· ·1	○	·3 ·2
23	○ 1· ○ 2· 4·	○	3·
24	4· ·2	○	·1 3·
25	4· 1· 3·	○	·2
26	·4 3·	○	·1 2·
27	·4 ·3 2· ·1	○	
28	·4 ·3 ·2	○	1·
29	·4 ·1	○	·3 ·2
30	○ 1· ·4	○	2· ·3
31	·2	○	·1 ·4 3·

WASHINGTON MEAN TIME.

JUNE.

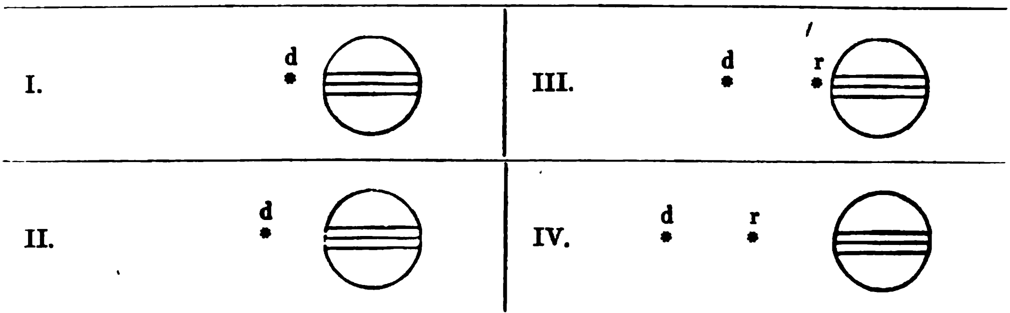
d	h	m	s				d	h	m	s				d	h	m	s			
1	6	4		III.	Sh.	In.	10	7	11		I.	Tr.	Eg.	20	20	7		II.	Sh.	In.
	6	58	43.4	II.	Ec.	Dis.		9	11		II.	Tr.	Eg.		20	58		I.	Sh.	Eg.
	7	26		I.	Sh.	In.	11	1	4	15.4	I.	Ec.	Dis.		21	52		I.	Tr.	Eg.
	8	36		I.	Tr.	In.		4	25		I.	Oc.	Re.		21	52		II.	Tr.	In.
	9	40		III.	Sh.	Eg.		22	16		I.	Sh.	In.		23	0		II.	Sh.	Eg.
	9	46		I.	Sh.	Eg.		22	49	22.4	II.	Ec.	Dis.	21	0	46		II.	Tr.	Eg.
	10	47		III. *	Tr.	In.		23	18		I.	Tr.	In.		15	55	30.5	I.	Ec.	Dis.
	10	56		I. *	Tr.	Eg.	12	0	8	43.2	III.	Eq.	Dis.		19	6		I.	Oc.	Re.
	12	8		II. *	Oc.	Re.		0	36		I.	Sh.	Eg.	22	13	6		I. *	Sh.	In.
	14	28		III. *	Tr.	Eg.		1	38		I.	Tr.	Eg.		13	58		I. *	Tr.	In.
2	4	41	36.1	I.	Ec.	Dis.		3	36	26.0	III.	Ec.	Re.		14	40	14.7	II. *	Ec.	Dis.
	8	10		I.	Oc.	Re.		3	43		II.	Oc.	Re.		15	26		I.	Sh.	Eg.
3	1	34		II.	Sh.	In.		4	13		III.	Oc.	Dis.		16	18		I.	Tr.	Eg.
	1	54		I.	Sh.	In.		7	54		III.	Oc.	Re.		18	0		III.	Sh.	In.
	3	3		I.	Tr.	In.		19	32	43.0	I.	Ec.	Dis.		19	13		II.	Oc.	Re.
	3	50		II.	Tr.	In.		22	52		I.	Oc.	Re.		21	25		III.	Tr.	In.
	4	14		I.	Sh.	Eg.	13	16	44		I.	Sh.	In.		21	38		III.	Sh.	Eg.
	4	27		II.	Sh.	Eg.		17	30		II.	Sh.	In.	23	1	6		III.	Tr.	Eg.
	5	23		I.	Tr.	Eg.		17	45		I.	Tr.	In.		10	24	2.0	I.	Ec.	Dis.
	6	45		II.	Tr.	Eg.		19	4		I.	Sh.	Eg.		13	33		I. *	Oc.	Re.
	23	10	10.3	I.	Ec.	Dis.		19	28		II.	Tr.	In.	24	7	32		IV.	Sh.	In.
4	2	37		I.	Oc.	Re.		20	5		I.	Tr.	Eg.		7	34		I.	Sh.	In.
	20	8	50.3	III.	Ec.	Dis.		20	23		II.	Sh.	Eg.		8	24		I.	Tr.	In.
	20	15	35.5	II.	Ec.	Dis.		22	23		II.	Tr.	Eg.		9	25		II.	Sh.	In.
	20	22		I.	Sh.	In.	14	14	1	19.0	I. *	Ec.	Dis.		9	54		I.	Sh.	Eg.
	21	30		I.	Tr.	In.		17	19		I.	Oc.	Re.		10	44		I. *	Tr.	Eg.
	22	42		I.	Sh.	Eg.	15	11	13		I. *	Sh.	In.		11	2		II. *	Tr.	In.
	23	36	3.5	III.	Ec.	Re.		12	6	18.3	II. *	Ec.	Dis.		12	9		IV. *	Sh.	Eg.
	23	50		I.	Tr.	Eg.		12	12		I. *	Tr.	In.		12	18		II. *	Sh.	Eg.
5	0	37		III.	Oc.	Dis.		13	33		I. *	Sh.	Eg.		13	57		II. *	Tr.	Eg.
	1	20		II.	Oc.	Re.		14	1		III. *	Sh.	In.		14	59		IV. *	Tr.	In.
	4	18		III.	Oc.	Re.		14	32		I. *	Tr.	Eg.		19	49		IV.	Tr.	Eg.
	17	38	36.9	I.	Ec.	Dis.		16	53		II.	Oc.	Re.	25	4	52	39.7	I.	Ec.	Dis.
	21	4		I.	Oc.	Re.		17	38		III.	Sh.	Eg.		7	59		I.	Oc.	Re.
6	14	51		I. *	Sh.	In.		17	56		III.	Tr.	In.	26	2	3		I.	Sh.	In.
	14	53		II. *	Sh.	In.		21	37		III.	Tr.	Eg.		2	50		I.	Tr.	In.
	15	57		I.	Tr.	In.		21	48	22.2	IV.	Ec.	Dis.		3	57	14.5	II.	Ec.	Dis.
	17	3		II.	Tr.	In.	16	2	13	22.4	IV.	Ec.	Re.		4	23		I.	Sh.	Eg.
	17	11		I.	Sh.	Eg.		6	39		IV.	Oc.	Dis.		5	10		I.	Tr.	Eg.
	17	46		II.	Sh.	Eg.		8	29	48.8	I.	Ec.	Dis.		8	8	8.1	III.	Ec.	Dis.
	18	17		I.	Tr.	Eg.		11	28		IV. *	Oc.	Re.		8	22		II.	Oc.	Re.
	19	58		II.	Tr.	Eg.		11	46		I. *	Oc.	Re.		14	53		III. *	Oc.	Re.
7	12	7	11.4	I. *	Ec.	Dis.	17	5	42		I.	Sh.	In.		23	21	10.0	I.	Ec.	Dis.
	13	26		IV. *	Sh.	In.		6	39		I.	Tr.	In.	27	2	26		I.	Oc.	Re.
	15	31		I.	Oc.	Re.		6	48		II.	Sh.	In.		20	31		I.	Sh.	In.
	17	59		IV.	Sh.	Eg.		8	2		I.	Sh.	Eg.		21	16		I.	Tr.	In.
	23	24		IV.	Tr.	In.		8	40		II.	Tr.	In.		22	44		II.	Sh.	In.
8	4	13		IV.	Tr.	Eg.		8	59		I.	Tr.	Eg.		22	51		I.	Sh.	Eg.
	9	19		I.	Sh.	In.		9	41		II.	Sh.	Eg.		23	36		I.	Tr.	Eg.
	9	32	28.4	II.	Ec.	Dis.		11	35		II. *	Tr.	Eg.	28	0	12		II.	Tr.	In.
	10	3		III.	Sh.	In.	18	2	58	25.2	I.	Ec.	Dis.		1	37		II.	Sh.	Eg.
	10	24		I.	Tr.	In.		6	13		I.	Oc.	Re.		3	7		II.	Tr.	Eg.
	11	39		I. *	Sh.	Eg.	19	0	10		I.	Sh.	In.		17	49	48.0	I.	Ec.	Dis.
	12	44		I. *	Tr.	Eg.		1	6		I.	Tr.	In.		20	52		I.	Oc.	Re.
	13	40		III. *	Sh.	Eg.		1	23	15.0	II.	Ec.	Dis.	29	15	0		I. *	Sh.	In.
	14	24		III. *	Tr.	In.		2	30		I.	Sh.	Eg.		15	42		I.	Tr.	In.
	14	32		II. *	Oc.	Re.		3	26		I.	Tr.	Eg.		17	14	18.6	II.	Ec.	Dis.
	18	5		III.	Tr.	Eg.		4	8	14.7	III.	Ec.	Dis.		17	20		I.	Sh.	Eg.
9	6	35	40.3	I.	Ec.	Dis.		6	3		II.	Oc.	Re.		18	2		I.	Tr.	Eg.
	9	58		I.	Oc.	Re.		7	35	25.3	III.	Ec.	Re.		21	30		II.	Oc.	Re.
10	3	47		I.	Sh.	In.		7	44		III.	Oc.	Dis.		21	59		III.	Sh.	In.
	4	11		II.	Sh.	In.		11	25		III. *	Oc.	Re.	30	0	50		III.	Tr.	In.
	4	51		I.	Tr.	In.		21	26	53.8	I.	Ec.	Dis.		1	37		III.	Sh.	Eg.
	6	7		I.	Sh.	Eg.	20	0	39		I.	Oc.	Re.		4	31		III.	Tr.	Eg.
	6	16		II.	Tr.	In.		18	38		I.	Sh.	In.		12	18	21.0	I. *	Ec.	Dis.
	7	4		II.	Sh.	Eg.		19	32		I.	Tr.	In.		15	18		I. *	Oc.	Re.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

JUNE.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 13ʰ for an Inverting Telescope.

Day.	West.		East.
1	○ 3· 1·	○	·2 ·4
2	3·	○	·1 2· ·4
3	·3 1· 2·	○	·4
4	·3 ·2	○	1· 4·
5	·1	○	·3 ·2 4·
6		○	1· 2· 4· ·3
7	2· ·1	○	4· 3·
8	4· 1·	○	3· ·2 ●
9	4· 3·	○	·1 2·
10	4· ·3 1· 2·	○	
11	4· ·3 ·2	○	·1
12	·4 ·1	○	·3 ·2
13	·4	○	1· 2· ·3
14	·4 2· ·1	○	3·
15	○ 1· ·4 ·2	○	3·
16	3·	○	·4 ·1 2·
17	3· 1· 2·	○	·4
18	·3 ·2	○	·1 ·4
19	·1	○	·3 ·2 .4
20		○	1· 2· ·3 4·
21	2· ·1	○	3· 4·
22	·2	○	1· 3· 4·
23	3·	○	·2 4· ·1 ●
24	○ 2· 3· 1·	○	4·
25	·3 ·2 4·	○	·1
26	4· 1·	○	·2 ·3 ●
27	4·	○	1· 2· ·3
28	4· 2· ·1	○	3·
29	·4 ·2	○	1· 3·
30	·4 3·	○	·2 ·1 ●

WASHINGTON MEAN TIME.

JULY.

d	h	m	s			
1	9	28		I. *	Sh.	In.
	10	9		I. *	Tr.	In.
	11	48		I. *	Sh.	Eg.
	12	2		II. *	Sh.	In.
	12	29		I. *	Tr.	Eg.
	13	22		II. *	Tr.	In.
	14	55		II.	Sh.	Eg.
	16	17		II.	Tr.	Eg.
2	6	47	0.2	I.	Ec.	Dis.
	9	45		I. *	Oc.	Re.
	15	52	39.9	IV.	Ec.	Dis.
	20	21	8.1	IV.	Ec.	Re.
	21	46		IV.	Oc.	Dis.
3	2	36		IV.	Oc.	Re.
	3	57		I.	Sh.	In.
	4	35		I.	Tr.	In.
	6	17		I.	Sh.	Eg.
	6	31	22.9	II.	Ec.	Dis.
	6	55		I.	Tr.	Eg.
	10	39		II. *	Oc.	Re.
	12	7	34.8	III. *	Ec.	Dis.
	18	17		III.	Oc.	Re.
4	1	15	31.8	I.	Ec.	Dis.
	4	11		I.	Oc.	Re.
	22	25		I.	Sh.	In.
	23	1		I.	Tr.	In.
5	0	45		I.	Sh.	Eg.
	1	21		II.	Sh.	In.
	1	21		I.	Tr.	Eg.
	2	32		II.	Tr.	In.
	4	14		II.	Sh.	Eg.
	5	27		II.	Tr.	Eg.
	19	44	11.0	I.	Ec.	Dis.
	22	38		I.	Oc.	Re.
6	16	54		I.	Sh.	In.
	17	28		I.	Tr.	In.
	19	14		I.	Sh.	Eg.
	19	48		I.	Tr.	Eg.
	19	48	32.0	II.	Ec.	Dis.
	23	47		II.	Oc.	Re.
7	1	59		III.	Sh.	In.
	4	12		III.	Tr.	In.
	5	38		III.	Sh.	Eg.
	7	54		III.	Tr.	Eg.
	14	12	45.3	I. *	Ec.	Dis.
	17	5		I.	Oc.	Re.
8	11	22		I.	Sh.	In.
	11	54		I.	Tr.	In.
	13	42		I.	Sh.	Eg.
	14	14		I.	Tr.	Eg.
	14	39		II.	Sh.	In.
	15	41		II.	Tr.	In.
	17	33		II.	Sh.	Eg.
	18	36		II.	Tr.	Eg.
9	8	41	25.7	I.	Ec.	Dis.
	11	30		I. *	Oc.	Re.
10	5	51		I.	Sh.	In.
	6	20		I.	Tr.	In.
	8	11		I.	Sh.	Eg.
	8	40		I.	Tr.	Eg.
	9	5	41.4	II.	Ec.	Dis.
	12	54		II. *	Oc.	Re.
	16	7	2.2	III.	Ec.	Dis.
	21	37		III.	Oc.	Re.
11	1	39		IV.	Sh.	In.
	3	9	58.9	I.	Ec.	Dis.

d	h	m	s			
11	5	49		IV.	Tr.	In.
	5	56		I.	Oc.	Re.
	6	19		IV.	Sh.	Eg.
	10	39		IV. *	Tr.	Eg.
12	0	19		I.	Sh.	In.
	0	46		I.	Tr.	In.
	2	39		I.	Sh.	Eg.
	3	6		I.	Tr.	Eg.
	3	57		II.	Sh.	In.
	4	50		II.	Tr.	In.
	6	51		II.	Sh.	Eg.
	7	45		II.	Tr.	Eg.
	21	38	39.5	I.	Ec.	Dis.
13	0	22		I.	Oc.	Re.
	18	48		I.	Sh.	In.
	19	11		I.	Tr.	In.
	21	8		I.	Sh.	Eg.
	21	31		I.	Tr.	Eg.
	22	22	55.8	II.	Ec.	Dis.
14	2	2		II.	Oc.	Re.
	5	59		III.	Sh.	In.
	7	32		III.	Tr.	In.
	9	38		III. *	Sh.	Eg.
	11	13		III. *	Tr.	Eg.
	16	7	15.3	I.	Ec.	Dis.
	18	48		I.	Oc.	Re.
15	13	16		I. *	Sh.	In.
	13	37		I. *	Tr.	In.
	15	36		I.	Sh.	Eg.
	15	57		I.	Tr.	Eg.
	17	16		II.	Sh.	In.
	17	58		II.	Tr.	In.
	20	10		II.	Sh.	Eg.
	20	53		II.	Tr.	Eg.
16	10	35	57.3	I.	Ec.	Dis.
	13	14		I. *	Oc.	Re.
17	7	45		I.	Sh.	In.
	8	3		I.	Tr.	In.
	10	5		I. *	Sh.	Eg.
	10	23		I. *	Tr.	Eg.
	11	40	11.4	II. *	Ec.	Dis.
	15	9		II.	Oc.	Re.
	20	6	45.8	III.	Ec.	Dis.
18	0	55		III.	Oc.	Re.
	5	4	32.0	I.	Ec.	Dis.
	7	40		I.	Oc.	Re.
19	2	13		I.	Sh.	In.
	2	29		I.	Tr.	In.
	4	33		I.	Sh.	Eg.
	4	49		I.	Tr.	Eg.
	6	35		II.	Sh.	In.
	7	6		II.	Tr.	In.
	9	29		II. *	Sh.	Eg.
	9	58	28.3	IV. *	Ec.	Dis.
	10	1		II. *	Tr.	Eg.
	17	4		IV.	Oc.	Re.
	23	33	14.3	I.	Ec.	Dis.
20	2	6		I.	Oc.	Re.
	20	42		I.	Sh.	In.
	20	55		I.	Tr.	In.
	23	2		I.	Sh.	Eg.
	23	15		I.	Tr.	Eg.
21	0	57	31.4	II.	Ec.	Dis.
	4	16		II.	Oc.	Re.
	9	59		III. *	Sh.	In.
	10	49		III. *	Tr.	In.

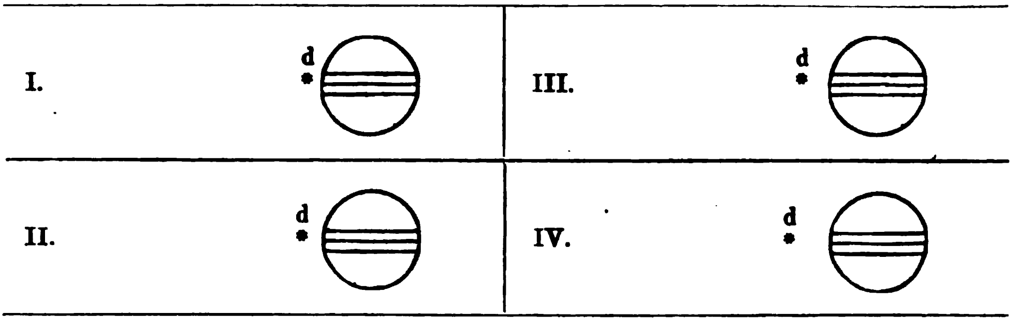
d	h	m	s			
21	13	38		III. *	Sh.	Eg.
	14	30		III. *	Tr.	Eg.
	18	1	52.1	I.	Ec.	Dis.
	20	32		I.	Oc.	Re.
22	15	10		I.	Sh.	In.
	15	21		I.	Tr.	In.
	17	30		I.	Sh.	Eg.
	17	41		I.	Tr.	Eg.
	19	53		II.	Sh.	In.
	20	14		II.	Tr.	In.
	22	47		II.	Sh.	Eg.
	23	9		II.	Tr.	Eg.
23	12	30	36.0	I. *	Ec.	Dis.
	14	58		I.	Oc.	Re.
24	9	39		I. *	Sh.	In.
	9	46		I. *	Tr.	In.
	11	59		I. *	Sh.	Eg.
	12	6		I. *	Tr.	Eg.
	14	14	54.0	II. *	Ec.	Dis.
	17	22		II.	Oc.	Re.
25	0	6	43.6	III.	Ec.	Dis.
	4	12		III.	Oc.	Re.
	6	59	12.9	I.	Ec.	Dis.
	9	24		I. *	Oc.	Re.
26	4	8		I.	Sh.	In.
	4	12		I.	Tr.	In.
	6	28		I.	Sh.	Eg.
	6	32		I.	Tr.	Eg.
	9	12		II.	Sh.	In.
	9	22		II. *	Tr.	In.
	12	6		II. *	Sh.	Eg.
	12	17		II. *	Tr.	Eg.
27	1	27	56.7	I.	Ec.	Dis.
	3	50		I.	Oc.	Re.
	19	48		IV.	Sh.	In.
	20	12		IV.	Tr.	In.
	22	36		I.	Sh.	In.
	22	38		I.	Tr.	In.
28	0	31		IV.	Sh.	Eg.
	0	56		I.	Sh.	Eg
	0	58		I.	Tr.	Eg.
	1	1		IV.	Tr.	Eg.
	3	32	20.4	II.	Ec.	Dis.
	6	29		II.	Oc.	Re.
	13	59		III. *	Sh.	In.
	14	5		III. *	Tr.	In.
	17	39		III.	Sh.	Eg.
	17	46		III.	Tr.	Eg.
	19	56		I.	Oc.	Dis.
	22	16		I.	Oc.	Re.
29	17	4		I.	Tr	In.
	17	5		I.	Sh	In.
	19	24		I.	Tr.	Eg.
	19	25		I.	Sh.	Eg.
	22	30		II.	Tr.	In.
	22	30		II.	Sh.	In.
30	1	24		II.	Tr.	Eg.
	1	25		II.	Sh.	Eg.
	14	22		I. *	Oc.	Dis.
	16	42		I.	Oc.	Re.
31	11	30		I. *	Tr.	In.
	11	33		I. *	Sh.	In.
	13	50		I, *	Tr.	Eg.
	13	53		I. *	Sh.	Eg.
	16	41		II.	Oc.	Dis.
	19	38	8.4	II.	Ec.	Re.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

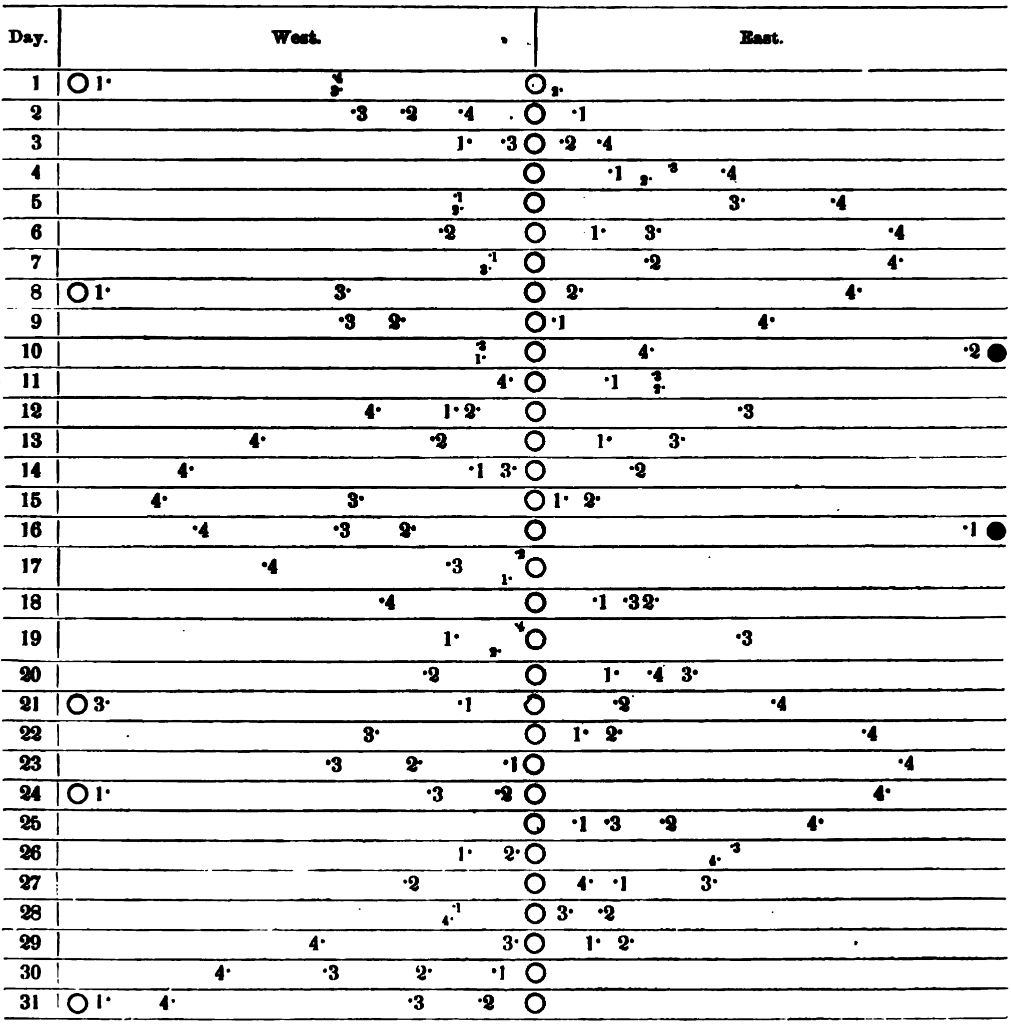
WASHINGTON MEAN TIME.

JULY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 12ʰ for an Inverting Telescope.



WASHINGTON MEAN TIME.

AUGUST.

d	h	m	s			
1	3	47		III.	Oc.	Dis.
	7	38	0.3	III.	Ec.	Re.
	8	48		I. *	Oc.	Dis.
	11	9	54.9	I. *	Ec.	Re.
2	5	56		I.	Tr.	In.
	6	2		I.	Sh.	In.
	8	16		I.	Tr.	Eg.
	8	22		I. *	Sh.	Eg.
	11	38		II. *	Tr.	In.
	11	49		II. *	Sh.	In.
	14	33		II.	Tr.	Eg.
	14	43		II.	Sh.	Eg.
3	3	14		I.	Oc.	Dis.
	5	38	39.5	I.	Ec.	Re.
4	0	22		I.	Tr.	In.
	0	30		I.	Sh.	In.
	2	42		I.	Tr.	Eg.
	2	50		I.	Sh.	Eg.
	5	48		II.	Oc.	Dis.
	8	55	49.5	II. *	Ec.	Re.
	17	21		III.	Tr.	In.
	17	59		III.	Sh.	In.
	21	2		III.	Tr.	Eg.
	21	39		III.	Sh.	Eg.
	21	40		I.	Oc.	Dis.
5	0	7	20.0	I.	Ec.	Re.
	2	25		IV.	Oc.	Dis.
	8	39	2.8	IV. *	Ec.	Re.
	18	48		I.	Tr.	In.
	18	59		I.	Sh.	In.
	21	8		I.	Tr.	Eg.
	21	19		I.	Sh.	Eg.
6	0	46		II.	Tr.	In.
	1	7		II.	Sh.	In.
	3	41		II.	Tr.	Eg.
	4	1		II.	Sh.	Eg.
	16	6		I.	Oc.	Dis.
	18	36	6.4	I.	Ec.	Re.
7	13	14		I. *	Tr.	In.
	13	27		I. *	Sh.	In.
	15	34		I.	Tr.	Eg.
	15	47		I.	Sh.	Eg.
	18	55		II.	Oc.	Dis.
	22	13	36.1	II.	Ec.	Re.
8	7	4		III.	Oc.	Dis.
	10	32		I. *	Oc.	Dis.
	11	38	43.6	III. *	Ec.	Re.
	13	4	46.0	I. *	Ec.	Re.
9	7	40		I.	Tr.	In.
	7	56		I.	Sh.	In.
	10	0		I. *	Tr.	Eg.
	10	16		I. *	Sh.	Eg.
	13	54		II.	Tr.	In.
	14	26		II.	Sh.	In.
	16	49		II.	Tr.	Eg.
	17	20		II.	Sh.	Eg.
10	4	58		I.	Oc.	Dis.
	7	33	32.1	I.	Ec.	Re.
11	2	6		I.	Tr.	In.
	2	24		I.	Sh.	In.
	4	26		I.	Tr.	Eg.
	4	44		I.	Sh.	Eg.
	8	2		II.	Oc.	Dis.
	11	31	23.2	II.	Ec.	Re.
	20	38		III.	Tr.	In.
	21	59		III.	Sh.	In.
11	23	24		I.	Oc.	Dis.
12	0	19		III.	Tr.	Eg.
	1	39		III.	Sh.	Eg.
	2	2	14.2	I.	Ec.	Re.
	20	32		I.	Tr.	In.
	20	53		I.	Sh.	In.
	22	52		I.	Tr.	Eg.
	23	13		I.	Sh.	Eg.
13	3	2		II.	Tr.	In.
	3	45		II.	Sh.	In.
	5	57		II.	Tr.	Eg.
	6	39		II.	Sh.	Eg.
	10	31		IV. *	Tr.	In.
	13	57		IV.	Sh.	In.
	15	19		IV.	Tr.	Eg.
	17	50		I.	Oc.	Dis.
	18	43		IV.	Sh.	Eg.
	20	31	2.3	I.	Ec.	Re.
14	14	58		I.	Tr.	In.
	15	21		I.	Sh.	In.
	17	18		I.	Tr.	Eg.
	17	41		I.	Sh.	Eg.
	21	9		II.	Oc.	Dis.
15	0	49	18.7	II.	Ec.	Re.
	10	22		III. *	Oc.	Dis.
	12	17		I. *	Oc.	Dis.
	14	59	43.7	I.	Ec.	Re.
	15	39	47.4	III.	Ec.	Re.
16	9	24		I. *	Tr.	In.
	9	50		I. *	Sh.	In.
	11	44		I. *	Tr.	Eg.
	12	10		I. *	Sh.	Eg.
	16	10		II.	Tr.	In.
	17	4		II.	Sh.	In.
	19	4		II.	Tr.	Eg.
	19	58		II.	Sh.	Eg.
17	6	43		I.	Oc.	Dis.
	9	28	30.9	I. *	Ec.	Re.
18	3	50		I.	Tr.	In.
	4	19		I.	Sh.	In.
	6	10		I.	Tr.	Eg.
	6	39		I.	Sh.	Eg.
	10	17		II. *	Oc.	Dis.
	14	7	12.7	II.	Ec.	Re.
	23	57		III.	Tr.	In.
19	1	9		I.	Oc.	Dis.
	1	59		III.	Sh.	In.
	3	38		III.	Tr.	Eg.
	3	57	14.4	I.	Ec.	Re.
	5	40		III.	Sh.	Eg.
	22	16		I.	Tr.	In.
	22	47		I.	Sh.	In.
20	0	36		I.	Tr.	Eg.
	1	8		I.	Sh.	Eg.
	5	19		II.	Tr.	In.
	6	22		II.	Sh.	In.
	8	13		II.	Tr.	Eg.
	9	16		II. *	Sh.	Eg.
	19	35		I.	Oc.	Dis.
	22	26	4.0	I.	Ec.	Re.
21	16	42		I.	Tr.	In.
	16	48		IV.	Oc.	Dis.
	17	16		I.	Sh.	In.
	19	2		I.	Tr.	Eg.
	19	37		I.	Sh.	Eg.
21	21	37		IV.	Oc.	Re.
	22	12	7.9	IV.	Ec.	Dis.
	23	25		II.	Oc.	Dis.
22	2	48	51.5	IV.	Ec.	Re.
	3	25	16.9	II.	Ec.	Re.
	13	42		III. *	Oc.	Dis.
	14	2		I.	Oc.	Dis.
	16	54	46.8	I.	Ec.	Re.
	19	40	24.8	III.	Ec.	Re.
23	11	8		I. *	Tr.	In.
	11	45		I. *	Sh.	In.
	13	28		I. *	Tr.	Eg.
	14	6		I.	Sh.	Eg.
	18	28		II.	Tr.	In.
	19	41		II.	Sh.	In.
	21	22		II.	Tr.	Eg.
	22	35		II.	Sh.	Eg.
24	8	28		I. *	Oc.	Dis.
	11	23	35.2	I.	Ec.	Re.
25	5	35		I.	Tr.	In.
	6	14		I.	Sh.	In.
	7	55		I.	Tr.	Eg.
	8	35		I. *	Sh.	Eg.
	12	34		II. *	Oc.	Dis.
	16	43	16.6	II.	Ec.	Re.
26	2	54		I.	Oc.	Dis.
	3	19		III.	Tr.	In.
	5	52	19.8	I.	Ec.	Re.
	6	0		III.	Sh.	In.
	7	0		III.	Tr.	Eg.
	9	41		III. *	Sh.	Eg.
27	0	1		I.	Tr.	In.
	0	43		I.	Sh.	In.
	2	21		I.	Tr.	Eg.
	3	4		I.	Sh.	Eg.
	7	37		II.	Tr.	In.
	8	59		II. *	Sh.	In.
	10	31		II. *	Tr.	Eg.
	11	54		II. *	Sh.	Eg.
	21	21		I.	Oc.	Dis.
28	0	21	10.2	I.	Ec.	Re.
	18	28		I.	Tr.	In.
	19	12		I.	Sh.	In.
	20	48		I.	Tr.	Eg.
	21	33		I.	Sh.	Eg.
29	1	43		II.	Oc.	Dis.
	6	1	30.2	II.	Ec.	Re.
	15	48		I.	Oc.	Dis.
	17	5		III.	Oc.	Dis.
	18	49	54.2	I.	Ec.	Re.
	23	41	1.9	III.	Ec.	Re.
30	1	14		IV.	Tr.	In.
	6	1		IV.	Tr.	Eg.
	8	7		IV.	Sh.	In.
	12	55		IV. *	Sh.	Eg.
	12	55		I. *	Tr.	In.
	13	40		I. *	Sh.	In.
	15	15		I.	Tr.	Eg.
	16	1		I.	Sh.	Eg.
	20	46		II.	Tr.	In.
	22	18		II.	Sh.	In.
	23	40		II.	Tr.	Eg.
31	1	13		II.	Sh.	Eg.
	10	14		I. *	Oc.	Dis.
	13	18	43.7	I. *	Ec.	Re.

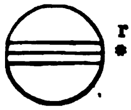
NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse. Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

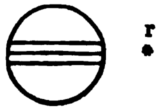
AUGUST.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

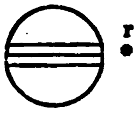
I.



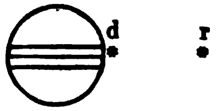
III.



II.



IV.



Configurations at 11h for an Inverting Telescope.

Day.	West.		East.
1	·4	○	·3 ·2 ·1 ●
2	·4 1·	○	2· ·3
3	·4 ·2	○	·1 3·
4	·41·	○	·2 3·
5	3·	○	·4 1· 2·
6	3· 2· ·1	○	·4
7	·3 ·2	○	1· ·4
8		○	·3 ·2 ·4 ·1 ●
9	1·	○	2· ·3 4·
10	2·	○	·1 3· 4·
11	1·	○	3· 4· ·2 ●
12	3·	○	·1 2· 4·
13	○ 4· 3· ·1 2·	○	
14	·3 4· ·2	○	1·
15	4· ·1	○	·2 ·3 ●
16	○ 1· 4·	○	2· ·3
17	4· 2·	○	·1 3·
18	·4 1·	○	3· ·2 ●
19	·4 3·	○	·1 2·
20	3· ·4 ·1 2·	○	
21	·3 ·2 ·4	○	1·
22	·1 ·3	○	2 ·4
23		○	1· 2· ·3 ·4
24	·2	○	·1 3· ·4
25	1· ·2	○	3· ·4
26	3·	○	·1 ·2 4·
27	3· 1· 2·	○	4·
28	·3 ·2	○	1· 4·
29	3 ·1	○	2 4·
30	4·	○	1· 2· ·3
31	4· 2·	○	·3 ·1 ●

WASHINGTON MEAN TIME.

SEPTEMBER.

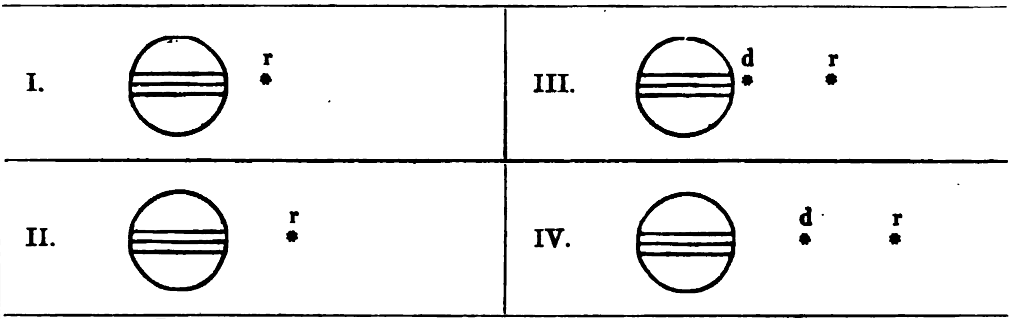
d	h	m	s				d	h	m	s				d	h	m	s			
1	7	21		I.	Tr.	In.	10	17	8		II.	Sh.	Eg.	20	20	38		I.	Tr.	Eg.
	8	9		I. *	Sh.	In.	11	0	55		I.	Oc.	Dis.		21	45		I.	Sh.	Eg.
	9	41		I. *	Tr.	Eg.		4	11	34.6	I.	Ec.	Re.	21	3	54		II.	Tr.	In.
	10	29		I. *	Sh.	Eg.		22	2		I.	Tr.	In.		6	9		II.	Sh.	In.
	14	52		II.	Oc.	Dis.		23	1		I.	Sh.	In.		6	48		II.	Tr.	Eg.
	19	19	36.0	II.	Ec.	Re.	12	0	22		I.	Tr.	Eg.		9	4		II. *	Sh.	Eg.
2	4	41		I.	Oc.	Dis.		1	21		I.	Sh.	Eg.		15	39		I.	Oc.	Dis.
	6	45		III.	Tr.	In.		6	23		II.	Oc.	Dis.		19	4	30.6	I.	Ec.	Re.
	7	47	29.3	I. *	Ec.	Re.		11	14	41.6	II.	Ec.	Re.	22	12	46		I.	Tr.	In.
	10	1		III. *	Sh.	In.		19	22		I.	Oc.	Dis.		13	54		I.	Sh.	In.
	10	25		III. *	Tr.	Eg.		22	40	20.9	I.	Ec.	Re.		15	6		I.	Tr.	Eg.
	13	42		III.	Sh.	Eg.	13	0	3		III.	Oc.	Dis.		16	14		I.	Sh.	Eg.
3	1	48		I.	Tr.	In.		3	43		III.	Oc.	Re.		22	0		II.	Oc.	Dis.
	2	37		I.	Sh.	In.		4	10	48.8	III.	Ec.	Dis.	23	3	10	0.1	II.	Ec.	Re.
	4	8		I.	Tr.	Eg.		7	42	57.8	III. *	Ec.	Re.		10	7		I. *	Oc.	Dis.
	4	57		I.	Sh.	Eg.		16	29		I.	Tr.	In.		13	33	18.8	I.	Ec.	Re.
	9	56		II.	Tr.	In.		17	30		I.	Sh.	In.		17	25		III.	Tr.	In.
	11	36		II.	Sh.	In.		18	49		I.	Tr.	Eg.		21	5		III.	Tr.	Eg.
	12	50		II.	Tr.	Eg.		19	50		I.	Sh.	Eg.		22	4		III.	Sh.	In.
	14	31		II.	Sh.	Eg.	14	1	29		II.	Tr.	In.		23	39		IV.	Oc.	Dis.
	23	8		I.	Oc.	Dis.		3	32		II.	Sh.	In.	24	1	46		III.	Sh.	Eg.
4	2	16	20.7	I.	Ec.	Re.		4	23		II.	Tr.	Eg.		4	25		IV.	Oc.	Re.
	20	14		I.	Tr.	In.		6	27		II.	Sh.	Eg.		7	13		I.	Tr.	In.
	21	6		I.	Sh.	In.		13	49		I.	Oc.	Dis.		8	23		I. *	Sh.	In.
	22	34		I.	Tr.	Eg.		17	9	11.7	I.	Ec.	Re.		9	33		I. *	Tr.	Eg.
	23	26		I.	Sh.	Eg.	15	10	56		I. *	Tr.	In.		10	30	18.4	IV. *	Ec.	Dis.
5	4	2		II.	Oc.	Dis.		11	59		I.	Sh.	In.		10	43		I. *	Sh.	Eg.
	8	37	58.6	II. *	Ec.	Re.		13	16		I.	Tr.	Eg.		15	10	46.0	IV.	Ec.	Re.
	17	34		I.	Oc.	Dis.		14	19		I.	Sh.	Eg.		17	7		II.	Tr.	In.
	20	32		III.	Oc.	Dis.		16	43		IV.	Tr.	In.		19	27		II.	Sh.	In.
	20	45	5.7	I.	Ec.	Re.		19	35		II.	Oc.	Dis.		20	1		II.	Tr.	Eg.
6	3	41	54.5	III.	Ec.	Re.		21	29		IV.	Tr.	Eg.		22	22		II.	Sh.	Eg.
	14	41		I.	Tr.	In.	16	0	32	58.0	II.	Ec.	Re.	25	4	34		I.	Oc.	Dis.
	15	35		I.	Sh.	In.		2	19		IV.	Sh.	In.		8	2	12.1	I. *	Ec.	Re.
	17	1		I.	Tr.	Eg.		7	10		IV.	Sh.	Eg.	26	1	41		I.	Tr.	In.
	17	55		I.	Sh.	Eg.		8	17		I. *	Oc.	Dis.		2	52		I.	Sh.	In.
	23	7		II.	Tr.	In.		11	37	59.1	I.	Ec.	Re.		4	1		I.	Tr.	Eg.
7	0	55		II.	Sh.	In.		13	48		III.	Tr.	In.		5	12		I.	Sh.	Eg.
	2	1		II.	Tr.	Eg.		17	28		III.	Tr.	Eg.		11	14		II. *	Oc.	Dis.
	3	50		II.	Sh.	Eg.		18	3		III.	Sh.	In.		16	28	49.6	II.	Ec.	Re.
	7	48		IV. *	Oc.	Dis.		21	45		III.	Sh.	Eg.		23	1		I.	Oc.	Dis.
	12	1		I.	Oc.	Dis.	17	5	23		I.	Tr.	In.	27	2	30	59.5	I.	Ec.	Re.
	12	35		IV.	Oc.	Re.		6	28		I.	Sh.	In.		7	20		III.	Oc.	Dis.
	15	13	55.8	I.	Ec.	Re.		7	43		I. *	Tr.	Eg.		11	0		III. *	Oc.	Re.
	16	21	7.0	IV.	Ec.	Dis.		8	48		I. *	Sh.	Eg.		12	13	32.3	III.	Ec.	Dis.
	20	59	49.8	IV.	Ec.	Re.		14	41		II.	Tr.	In.		15	46	2.9	III.	Ec.	Re.
8	9	8		I. *	Tr.	In.		16	50		II.	Sh.	In.		20	9		I.	Tr.	In.
	10	4		I. *	Sh.	In.		17	35		II.	Tr.	Eg.		21	21		I.	Sh.	In.
	11	28		I.	Tr.	Eg.		19	45		II.	Sh.	Eg.		22	29		I.	Tr.	Eg.
	12	24		I.	Sh.	Eg.	18	2	44		I.	Oc.	Dis.		23	41		I.	Sh.	Eg
	17	12		II.	Oc.	Dis.		6	6	52.2	I.	Ec.	Re.	28	6	21		II.	Tr.	In.
	21	56		II.	Ec.	Re.		23	51		I.	Tr.	In.		8	45		II. *	Sh.	In.
9	6	28	8.9	I.	Oc.	Dis.	19	0	57		I.	Sh.	In.		9	15		II. *	Tr.	Eg.
	9	42	42.3	I. *	Ec.	Re.		2	11		I.	Tr.	Eg.		11	41		II.	Sh.	Eg.
	10	14		III. *	Tr.	In.		3	17		I.	Sh.	Eg.		17	30		I.	Oc.	Dis.
	13	54		III.	Tr.	Eg.		8	47		II. *	Oc.	Dis.		20	59	51.0	I.	Ec.	Re.
	14	2		III.	Sh.	In.		13	51	38.9	II.	Ec.	Re.	29	14	37		I.	Tr.	In.
	17	44		III.	Sh.	Eg.		21	12		I.	Oc.	Dis.		15	50		I.	Sh.	In.
10	3	35		I.	Tr.	In.	20	0	35	39.4	I.	Ec.	Re.		16	57		I.	Tr.	Eg.
	4	32		I.	Sh.	In.		3	39		III.	Oc.	Dis.		18	10		I.	Sh.	Eg.
	5	55		I.	Tr.	Eg.		7	19		III.	Oc.	Re.	30	0	28		II.	Oc.	Dis.
	6	52		I.	Sh.	Eg.		8	12	23.4	III. *	Ec.	Dis.		5	47	14.8	II.	Ec.	Re.
	12	18		II.	Tr.	In.		11	44	43.6	III.	Ec.	Re.		11	58		I.	Oc.	Dis.
	14	13		II.	Sh.	In.		18	18		I.	Tr.	In.		15	28	39.5	I.	Ec.	Re.
	15	12		II.	Tr.	Eg.		19	25		I.	Sh.	In.		21	9		III.	Tr.	In.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite, Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

SEPTEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 9h 30m for an Inverting Telescope.

Day.	West.		East.
1	○ 1· 4· ·2	○	3·
2	○ 3· 4·	○	·1 ·2
3	○ 2· ·4 3· 1·	○	
4	·4 ·3 ·2	○	·1
5	·4 ·3 ·1	○	·2
6	·4	○	1· ·3 2·
7	2· ·1	○	·3 ·4 ●
8	○ 1· ·2	○	·4 3·
9		○	·1 3· ·2 ·4
10	3· 1·	○	2· ·4
11	·3 2·	○	·1 ·4
12	·3 1·	○	·2 4·
13		○	·3 1· 2· 4·
14	2· ·1	○	4· ·3
15	·2	○	1· 4· 3·
16	4·	○	3· ·2 ·1 ●
17	4· 3· 1·	○	2·
18	4· 3· 2·	○	·1
19	4· ·3 1·	○	·2 ●
20	·4	○	·3 1· 2·
21	·4 ·1 2·	○	·3
22	·4 ·2	○	1· 3·
23	·4 ·1	○	3· ·2
24	○ 1· 3·	○	·4 2·
25	3· 2·	○	·1 ·4
26	·3 1· ·2	○	·4
27		○	·1 ·2 ·4 ·3 ●
28	·1 2·	○	·3 4·
29	·2	○	1· 3· 4·
30	·1	○	·2 3· 4·

WASHINGTON MEAN TIME.

OCTOBER.

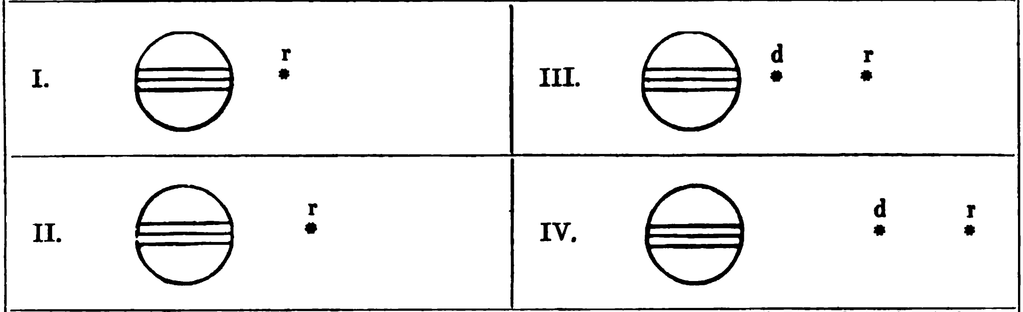
d	h	m	s			
1	0	48		III.	Tr.	Eg.
	2	5		III.	Sh.	In.
	5	47		III.	Sh.	Eg.
	9	5		I.	Tr.	In.
	10	18		I.	Sh.	In.
	11	25		I.	Tr.	Eg.
	12	38		I.	Sh.	Eg.
	19	36		II.	Tr.	In.
	22	4		II.	Sh.	In.
	22	30		II.	Tr.	Eg.
2	1	0		II.	Sh.	Eg.
	6	25		I.	Oc.	Dis.
	9	6		IV.	Tr.	In.
	9	57	33.1	I.	Ec.	Re.
	13	51		IV.	Tr.	Eg.
	20	31		IV.	Sh.	In.
3	1	23		IV.	Sh.	Eg.
	3	33		I.	Tr.	In.
	4	47		I.	Sh.	In.
	5	53		I.	Tr.	Eg.
	7	7		I. *	Sh.	Eg.
	13	43		II.	Oc.	Dis.
	19	6	12.2	II.	Ec.	Re.
4	0	53		I.	Oc.	Dis.
	4	26	21.3	I.	Ec.	Re.
	11	6		III.	Oc.	Dis.
	14	46		III.	Oc.	Re.
	16	14	56.6	III.	Ec.	Dis.
	19	47	36.8	III.	Ec.	Re.
	22	1		I.	Tr.	In.
	23	16		I.	Sh.	In.
5	0	21		I.	Tr.	Eg.
	1	36		I.	Sh.	Eg.
	8	51		II. *	Tr.	In.
	11	22		II.	Sh.	In.
	11	45		II.	Tr.	Eg.
	14	18		II.	Sh.	Eg.
	19	21		I.	Oc.	Dis.
	22	55	12.8	I.	Ec.	Re.
6	16	29		I.	Tr.	In.
	17	45		I.	Sh.	In.
	18	49		I.	Tr.	Eg.
	20	5		I.	Sh.	Eg.
7	2	58		II.	Oc.	Dis.
	8	24	41.2	II. *	Ec.	Re.
	13	49		I.	Oc.	Dis.
	17	24	1.5	I.	Ec.	Re.
8	0	56		III.	Tr.	In.
	4	36		III.	Tr.	Eg.
	6	6		III.	Sh.	In.
	9	49		III.	Sh.	Eg.
	10	57		I.	Tr.	In.
	12	14		I.	Sh.	In.
	13	17		I.	Tr.	Eg.
	14	34		I.	Sh.	Eg.
	22	6		II.	Tr.	In.
9	0	40		II.	Sh.	In.
	1	0		II.	Tr.	Eg.
	3	36		II.	Sh.	Eg.
	8	18		I. *	Oc.	Dis.
	11	52	55.0	I.	Ec.	Re.
10	5	25		I.	Tr.	In.
	6	43		I.	Sh.	In.
	7	46		I. *	Tr.	Eg.
	9	3		I.	Sh.	Eg.
	16	14		II.	Oc.	Dis.
	16	30		IV.	Oc.	Dis.
	21	16		IV.	Oc.	Re.
	21	43	46.4	II.	Ec.	Re.
11	2	46		I.	Oc.	Dis.
11	4	40	17.0	IV.	Ec.	Dis.
	6	21	43.6	I.	Ec.	Re.
	9	22	5.4	IV.	Ec.	Re.
	14	56		III.	Oc.	Dis.
	18	36		III.	Oc.	Re.
	20	15	51.4	III.	Ec.	Dis.
	23	48	39.8	III.	Ec.	Re.
	23	53		I.	Tr.	In.
12	1	11		I.	Sh.	In.
	2	14		I.	Tr.	Eg.
	3	32		I.	Sh.	Eg.
	11	21		II.	Tr.	In.
	13	58		II.	Sh.	In.
	14	15		II.	Tr.	Eg.
	16	54		II.	Sh.	Eg.
	21	14		I.	Oc.	Dis.
13	0	50	34.7	I.	Ec.	Re.
	18	22		I.	Tr.	In.
	19	40		I.	Sh.	In.
	20	43		I.	Tr.	Eg.
	22	0		I.	Sh.	Eg.
14	5	30		II.	Oc.	Dis.
	11	2	18.7	II.	Ec.	Re.
	15	43		I.	Oc.	Dis.
	19	19	23.7	I.	Ec.	Re.
15	4	50		III.	Tr.	In.
	8	30		III. *	Tr.	Eg.
	10	8		III.	Sh.	In.
	12	50		I.	Tr.	In.
	13	51		III.	Sh.	Eg.
	14	9		I.	Sh.	In.
	15	11		I.	Tr.	Eg.
	16	29		I.	Sh.	Eg.
16	0	37		II.	Tr.	In.
	3	17		II.	Sh.	In.
	3	31		II.	Tr.	Eg.
	6	13		II.	Sh.	Eg.
	10	11		I.	Oc.	Dis.
	13	48	17.0	I.	Ec.	Re.
17	7	18		I. *	Tr.	In.
	8	38		I. *	Sh.	In.
	9	39		I.	Tr.	Eg.
	10	58		I.	Sh.	Eg.
	18	48		II.	Oc.	Dis.
18	0	21	31.0	II.	Ec.	Re.
	4	39		I.	Oc.	Dis.
	8	17	5.8	I. *	Ec.	Re.
	18	50		III.	Oc.	Dis.
	22	30		III.	Oc.	Re.
19	0	16	43.5	III.	Ec.	Dis.
	1	47		I.	Tr.	In.
	2	28		IV.	Tr.	In.
	3	7		I.	Sh.	In.
	3	49	38.5	III.	Ec.	Re.
	4	8		I.	Tr.	Eg.
	5	27		I.	Sh.	Eg.
	7	14		IV. *	Tr.	Eg.
	13	54		II.	Tr.	In.
	14	43		IV.	Sh.	In.
	16	35		II.	Sh.	In.
	16	48		II.	Tr.	Eg.
	19	31		II.	Sh.	Eg.
	19	37		IV.	Sh.	Eg.
	23	8		I.	Oc.	Dis.
20	2	45	57.4	I.	Ec.	Re.
	20	16		I.	Tr.	In.
	21	36		I.	Sh.	In.
	22	37		I.	Tr.	Eg.
	23	56		I.	Sh.	Eg.
21	8	5		II. *	Oc.	Dis.
21	13	40	6.3	II.	Ec.	Re.
	17	37		I.	Oc.	Dis.
	21	14	46.0	I.	Ec.	Re.
22	8	47		III.	Tr.	In.
	12	27		III.	Tr.	Eg.
	14	10		III.	Sh.	In.
	14	45		I.	Tr.	In.
	16	5		I.	Sh.	In.
	17	6		I.	Tr.	Eg.
	17	52		III.	Sh.	Eg.
	18	25		I.	Sh.	Eg.
23	3	11		II.	Tr.	In.
	5	53		II.	Sh.	In.
	6	5		II.	Tr.	Eg.
	8	49		II. *	Sh.	Eg.
	12	5		I.	Oc.	Dis.
	15	43	38.8	I.	Ec.	Re.
24	9	14		I.	Tr.	In.
	10	34		I.	Sh.	In.
	11	35		I.	Tr.	Eg.
	12	54		I.	Sh.	Eg.
	21	24		II.	Oc.	Dis.
25	2	59	25.1	II.	Ec.	Re.
	6	34		I.	Oc.	Dis.
	10	12	27.7	I.	Ec.	Re.
	22	49		III.	Oc.	Dis.
26	2	30		III.	Oc.	Re.
	3	43		I.	Tr.	In.
	4	17	49.4	III.	Ec.	Dis.
	5	3		I.	Sh.	In.
	6	3		I.	Tr.	Eg.
	7	23		I. *	Sh.	Eg.
	7	50	49.6	III. *	Ec.	Re.
	16	29		II.	Tr.	In.
	19	11		II.	Sh.	In.
	19	23		II.	Tr.	Eg.
	22	7		II.	Sh.	Eg.
27	1	3		I.	Oc.	Dis.
	4	41	18.5	I.	Ec.	Re.
	10	20		IV.	Oc.	Dis.
	15	6		IV.	Oc.	Re.
	22	12		I.	Tr.	In.
	22	51	23.3	IV.	Ec.	Dis.
	23	32		I.	Sh.	In.
28	0	33		I.	Tr.	Eg.
	1	52		I.	Sh.	Eg.
	3	34	9.7	IV.	Ec.	Re.
	10	43		II.	Oc.	Dis.
	16	18	2.8	II.	Ec.	Re.
	19	32		I.	Oc.	Dis.
	23	10	7.0	I.	Ec.	Re.
29	12	49		III.	Tr.	In.
	16	29		III.	Tr.	Eg.
	16	41		I.	Tr.	In.
	18	1		I.	Sh.	In.
	18	12		III.	Sh.	In.
	19	2		I.	Tr.	Eg.
	20	21		I.	Sh.	Eg.
	21	54		III.	Sh.	Eg.
30	5	48		II.	Tr.	In.
	8	29		II. *	Sh.	In.
	8	42		II. *	Tr.	Eg.
	11	25		II.	Sh.	Eg.
	14	1		I.	Oc.	Dis.
	17	38	59.5	I.	Ec.	Re.
31	11	10		I.	Tr.	In.
	12	30		I.	Sh.	In.
	13	31		I.	Tr.	Eg.
	14	50		I.	Sh.	Eg.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

OCTOBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 8ʰ for an Inverting Telescope.

Day.	West.		East.
1	3·	○	1· 2· 4·
2	○ 4· 3· 2·	○	·1 ●
3	·3 4· ·21·	○	
4	4· ·3	○	·1 ·2
5	4· 1·	○	2· ·3
6	4· ·2	○	1· 3·
7	·4 ·1	○	·2 3·
8	·4 3·	○	1· 2·
9	·4 3· 2· ·1	○	
10	·3 ·2 ·4 1·	○	
11	·3	○	·1 ·4 ·2
12	1·	○	2· ·3 ·4
13	2·	○	·1 ·3 ·4
14	·1	○	3· ·4 ·2 ●
15	○ 3·	○	1· 2· 4·
16	3· 2· ·1	○	4·
17	○ 1· ·3 ·2	○	4·
18	·3	○	·1 ·2 4·
19	1· 4·	○	·3 2·
20	4· 2·	○	·1 ·3
21	4· 1· ·2	○	3·
22	4·	○	3· 1· 2·
23	4· 3· ·1 2·	○	
24	·4 ·3 ·2	○	1·
25	·4 ·3	○	·2 ·1 ●
26	·4 1·	○	·3 2·
27	2· ·4	○	·1 ·3
28	1· ·2	○	·4 3·
29		○	3· 1· ·2 ·4
30	○ 2· 3· ·1	○	·4
31	3· ·2	○	1· ·4

WASHINGTON MEAN TIME.

NOVEMBER.

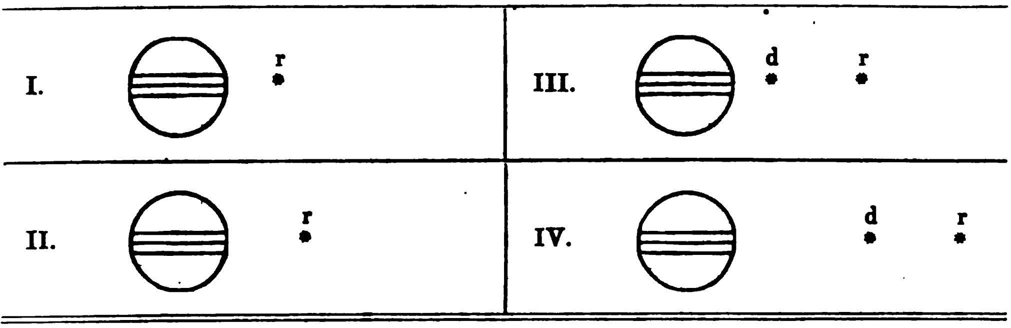
d	h	m	s			
1	0	2		II.	Oc.	Dis.
	5	37	27.7	II.	Ec.	Re.
	8	30		I.	Oc.	Dis.
	12	7	48.0	I.	Ec.	Re.
2	2	53		III.	Oc.	Dis.
	5	39		I.	Tr.	In.
	6	33		III.*	Oc.	Re.
	6	59		I.*	Sh.	In.
	7	59		I.	Tr.	Eg.
	8	19	1.8	III.	Ec.	Dis.
	9	19		I.	Sh.	Eg.
	11	52	6.2	III.	Ec.	Re.
	19	7		II.	Tr.	In.
	21	47		II.	Sh.	In.
	22	2		II.	Tr.	Eg.
3	0	43		II.	Sh.	Eg.
	2	59		I.	Oc.	Dis.
	6	36	38.1	I.*	Ec.	Re.
4	0	8		I.	Tr.	In.
	1	28		I.	Sh.	In.
	2	28		I.	Tr.	Eg.
	3	48		I.	Sh.	Eg.
	13	22		II.	Oc.	Dis.
	18	56	7.1	II.	Ec.	Re.
	20	46		IV.	Tr.	In.
	21	29		I.	Oc.	Dis.
5	1	5	27.7	I.	Ec.	Re.
	1	32		IV.	Tr.	Eg.
	8	56		IV.	Sh.	In.
	13	51		IV.	Sh.	Eg.
	16	55		III.	Tr.	In.
	18	38		I.	Tr.	In.
	19	57		I.	Sh.	In.
	20	35		III.	Tr.	Eg.
	20	58		I.	Tr.	Eg.
	22	13		III.	Sh.	In.
	22	17		I.	Sh.	Eg.
6	1	56		III.	Sh.	Eg.
	8	26		II.	Tr.	In.
	11	5		II.	Sh.	In.
	11	21		II.	Tr.	Eg.
	14	1		II.	Sh.	Eg.
	15	58		I.	Oc.	Dis.
	19	34	18.0	I.	Ec.	Re.
7	13	7		I.	Tr.	In.
	14	26		I.	Sh.	In.
	15	27		I.	Tr.	Eg.
	16	46		I.	Sh.	Eg.
8	2	43		II.	Oc.	Dis.
	8	15	37.2	II.	Ec.	Re.
	10	27		I.	Oc.	Dis.
	14	3	6.2	I.	Ec.	Re.
9	7	1		III.*	Oc.	Dis.
	7	37		I.	Tr.	In.
	8	55		I.	Sh.	In.
	9	57		I.	Tr.	Eg.
	10	41		III.	Oc.	Re.
	11	15		I.	Sh.	Eg.
	12	20	52.0	III.	Ec.	Dis.
	15	53	59.4	III.	Ec.	Re.
	21	46		II.	Tr.	In.
10	0	23		II.	Sh.	In.
	0	41		II.	Tr.	Eg.
	3	19		II.	Sh.	Eg.
	4	56		I.	Oc.	Dis.
	8	31	55.8	I.	Ec.	Re.
11	2	6		I.	Tr.	In.
	3	24		I.	Sh.	In.
11	4	26		I.	Tr.	Eg.
	5	44		I.	Sh.	Eg.
	16	4		II.	Oc.	Dis.
	21	34	17.5	II.	Ec.	Re.
	23	26		I.	Oc.	Dis.
12	3	0	46.4	I.	Ec.	Re.
	20	36		I.	Tr.	In.
	21	4		III.	Tr.	In.
	21	53		I.	Sh.	In.
	22	56		I.	Tr.	Eg.
13	0	13		I.	Sh.	Eg.
	0	45		III.	Tr.	Eg.
	2	14		III.	Sh.	In.
	5	1		IV.	Oc.	Dis.
	5	57		III.*	Sh.	Eg.
	9	49		IV.	Oc.	Re.
	11	6		II.	Tr.	In.
	13	41		II.	Sh.	In.
	14	1		II.	Tr.	Eg.
	16	37		II.	Sh.	Eg.
	17	2	18.1	IV.	Ec.	Dis.
	17	55		I.	Oc.	Dis.
	21	29	34.7	I.	Ec.	Re.
	21	45	41.7	IV.	Ec.	Re.
14	15	5		I.	Tr.	In.
	16	22		I.	Sh.	In.
	17	25		I.	Tr.	Eg.
	18	42		I.	Sh.	Eg.
15	5	26		II.	Oc.	Dis.
	10	53	52.1	II.	Ec.	Re.
	12	25		I.	Oc.	Dis.
	15	58	22.4	I.	Ec.	Re.
16	9	35		I.	Tr.	In.
	10	51		I.	Sh.	In.
	11	12		III.	Oc.	Dis.
	11	55		I.	Tr.	Eg.
	13	11		I.	Sh.	Eg.
	14	53		III.	Oc.	Re.
	16	22	10.3	III.	Ec.	Dis.
	19	55	19.1	III.	Ec.	Re.
17	0	27		II.	Tr.	In.
	2	59		II.	Sh.	In.
	3	22		II.	Tr.	Eg.
	5	55		II.*	Sh.	Eg.
	6	54		I.*	Oc.	Dis.
	10	27	11.2	I.	Ec.	Re.
18	4	5		I.	Tr.	In.
	5	19		I.	Sh.	In.
	6	25		I.*	Tr.	Eg.
	7	39		I.	Sh.	Eg.
	18	47		II.	Oc.	Dis.
19	0	12	33.6	II.	Ec.	Re.
	1	24		I.	Oc.	Dis.
	4	55	58.1	I.	Ec.	Re.
	22	34		I.	Tr.	In.
	23	48		I.	Sh.	In.
20	0	54		I.	Tr.	Eg.
	1	17		III.	Tr.	In.
	2	8		I.	Sh.	Eg.
	4	58		III.	Tr.	Eg.
	6	16		III.*	Sh.	In.
	9	59		III.	Sh.	Eg.
	13	48		II.	Tr.	In.
	16	17		II.	Sh.	In.
	16	43		II.	Tr.	Eg.
	19	13		II.	Sh.	Eg.
	19	54		I.	Oc.	Dis.
20	23	24	48.3	I.	Ec.	Re.
21	15	52		IV.	Tr.	In.
	17	4		I.	Tr.	In.
	18	17		I.	Sh.	In.
	19	24		I.	Tr.	Eg
	20	37		I.	Sh.	Eg.
	20	41		IV.	Tr.	Eg.
22	3	9		IV.	Sh.	In.
	8	5		IV.	Sh.	Eg.
	8	10		II.	Oc.	Dis.
	13	32	11.8	II.	Ec.	Re.
	14	23		I.	Oc.	Dis.
	17	53	35.4	I.	Ec.	Re.
23	11	34		I.	Tr.	In.
	12	46		I.	Sh.	In.
	13	54		I.	Tr.	Eg.
	15	6		I.	Sh.	Eg.
	15	27		III.	Oc.	Dis.
	19	8		III.	Oc.	Re.
	20	23	37.0	III.	Ec.	Dis.
	23	56	46.8	III.	Ec.	Re.
24	3	9		II.	Tr.	In.
	5	35		II.	Sh.	In.
	6	4		II.*	Tr.	Eg.
	8	31		II.	Sh.	Eg.
	8	53		I.	Oc.	Dis.
	12	22	23.4	I.	Ec.	Re.
25	6	4		I.*	Tr.	In.
	7	15		I.	Sh.	In.
	8	24		I.	Tr.	Eg.
	9	35		I.	Sh.	Eg.
	21	32		II.	Oc.	Dis.
26	2	50	53.4	II.	Ec.	Re.
	3	23		I.	Oc.	Dis.
	6	51	9.5	I.*	Ec.	Re.
27	0	34		I.	Tr.	In.
	1	44		I.	Sh.	In.
	2	54		I.	Tr.	Eg.
	4	4		I.	Sh.	Eg.
	5	34		III.	Tr.	In.
	9	15		III.	Tr.	Eg
	10	17		III.	Sh.	In.
	14	0		III.	Sh.	Eg.
	16	30		II.	Tr.	In.
	18	53		II.	Sh.	In.
	19	25		II.	Tr.	Eg.
	21	49		II.	Sh.	Eg.
	21	52		I.	Oc.	Dis.
28	1	19	58.9	I.	Ec.	Re.
	19	4		I.	Tr.	In.
	20	13		I.	Sh.	In.
	21	24		I.	Tr.	Eg.
	22	33		I.	Sh.	Eg.
29	10	56		II.	Oc.	Dis.
	16	10	34.5	II.	Ec.	Re.
	16	22		I.	Oc.	Dis.
	19	48	45.4	I.	Ec.	Re.
30	0	27		IV.	Oc.	Dis.
	5	17		IV.	Oc.	Re.
	11	13	31.5	IV.	Ec.	Dis.
	13	34		I.	Tr.	In.
	14	42		I.	Sh.	In.
	15	54		I.	Tr.	Eg.
	15	57	1.7	IV.	Ec.	Re.
	17	2		I.	Sh.	Eg.
	19	44		III.	Oc.	Dis.
	23	25		III.	Oc.	Re.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite, Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

NOVEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 6ʰ 30ᵐ for an Inverting Telescope.

Day.	West.		East.
1	·3 ·1	○	·2 4·
2	○ 1:	○	2· 4· ·3 ●
3	2·	○	·1 ·3 4·
4	2 1·	○	4· 3·
5	4·	○	·1 3· ·2
6	4· 1· 3·	○	2·
7	4· 3· 2·	○	1·
8	4· ·3 ·1	○	·2
9	·4 ·3	○	1· 2·
10	·4 2·	○	·3 ·1 ●
11	·4 ·2 1·	○	3·
12	·4	○	·1 2 3·
13	1· 3· ·4	○	2·
14	3· 2·	○	1· ·4
15	·3 ·1	○	·4 ·2 ●
16	·3	○	1· 2· ·4
17	2· ·1	○	·3 ·4
18	·2 1·	○	·3 4·
19		○	·1 ·2 3· 4·
20	1· 3·	○	2· 4·
21	3· 2·	○	4· ·1
22	·3 ·1 4· ·2	○	
23	4· ·3	○	1· ·2
24	4· ·12·	○	·3
25	○ 1· 4· ·2	○	·3
26	·4	○	·1 ·2 3·
27	○ 3· ·4 1·	○	2·
28	·4 3· 2·	○	·1
29	·3 ·41· ·2	○	
30	·3	○	·4 1· ·2

WASHINGTON MEAN TIME.

DECEMBER.

d	h	m	s			
1	0	24	32.2	III.	Ec.	Dis.
	3	57	41.4	III.	Ec.	Re.
	5	52		II.*	Tr.	In.
	8	11		II.	Sh.	In.
	8	47		II.	Tr.	Eg.
	10	52		I.	Oc.	Dis.
	11	7		II.	Sh.	Eg.
	14	17	32.2	I.	Ec.	Re.
2	8	4		I.	Tr.	In.
	9	11		I.	Sh.	In.
	10	24		I.	Tr.	Eg.
	11	31		I.	Sh.	Eg.
3	0	19		II.	Oc.	Dis.
	5	22		I.*	Oc.	Dis.
	5	29	15.9	II.*	Ec.	Re.
	8	46	17.7	I.	Ec.	Re.
4	2	34		I.	Tr.	In.
	3	40		I.	Sh.	In.
	4	54		I.	Tr.	Eg.
	6	0		I.*	Sh.	Eg.
	9	54		III.	Tr.	In.
	13	35		III.	Tr.	Eg.
	14	20		III.	Sh.	In.
	18	3		III.	Sh.	Eg.
	19	14		II.	Tr.	In.
	21	29		II.	Sh.	In.
	22	9		II.	Tr.	Eg.
	23	52		I.	Oc.	Dis.
5	0	25		II.	Sh.	Eg.
	3	15	5.9	I.	Ec.	Re.
	21	4		I.	Tr.	In.
	22	9		I.	Sh.	In.
	23	24		I.	Tr.	Eg.
6	0	29		I.	Sh.	Eg.
	13	44		II.	Oc.	Dis.
	18	22		I.	Oc.	Dis.
	18	48	59.1	II.	Ec.	Re.
	21	43	51.9	I.	Ec.	Re.
7	15	34		I.	Tr.	In.
	16	38		I.	Sh.	In.
	17	54		I.	Tr.	Eg.
	18	58		I.	Sh.	Eg.
8	0	4		III.	Oc.	Dis.
	3	45		III.	Oc.	Re.
	4	25	20.8	III.	Ec.	Dis.
	7	58	28.0	III.	Ec.	Re.
	8	38		II.	Tr.	In.
	10	46		II.	Sh.	In.
	11	33		II.	Tr.	Eg.
	11	37		IV.	Tr.	In.
	12	52		I.	Oc.	Dis.
	13	42		II.	Sh.	Eg.
	16	12	37.4	I.	Ec.	Re.
	16	28		IV.	Tr.	Eg.
	21	22		IV.	Sh.	In.
9	2	18		IV.	Sh.	Eg.
	10	4		I.	Tr.	In.
	11	7		I.	Sh.	In.
	12	24		I.	Tr.	Eg.
	13	27		I.	Sh.	Eg.
10	3	7		II.	Oc.	Dis.
	7	22		I.	Oc.	Dis.
	8	7	39.9	II.	Ec.	Re.
	10	41	21.9	I.	Ec.	Re.
11	4	34		I.	Tr.	In.
	5	36		I.*	Sh.	In.
	6	54		I.	Tr.	Eg.
11	7	56		I.	Sh.	Eg.
	14	15		III.	Tr.	In.
	17	57		III.	Tr.	Eg.
	18	22		III.	Sh.	In.
	22	0		II.	Tr.	In.
	22	4		III.	Sh.	Eg.
12	0	4		II.	Sh.	In.
	0	55		II.	Tr.	Eg.
	1	52		I.	Oc.	Dis.
	3	0		II.	Sh.	Eg.
	5	10	9.0	I.*	Ec.	Re.
	23	5		I.	Tr.	In.
13	0	5		I.	Sh.	In.
	1	25		I.	Tr.	Eg.
	2	25		I.	Sh.	Eg.
	16	32		II.	Oc.	Dis.
	20	22		I.	Oc.	Dis.
	21	27	24.3	II.	Ec.	Re.
	23	38	54.3	I.	Ec.	Re.
14	17	35		I.	Tr.	In.
	18	34		I.	Sh.	In.
	19	55		I.	Tr.	Eg.
	20	54		I.	Sh.	Eg.
15	4	26		III.	Oc.	Dis.
	8	8		III.	Oc.	Re.
	8	26	21.2	III.	Ec.	Dis.
	11	23		II.	Tr.	In.
	11	59	25.2	III.	Ec.	Re.
	13	21		II.	Sh.	In.
	14	18		II.	Tr.	Eg.
	14	52		I.	Oc.	Dis.
	16	18		II.	Sh.	Eg.
	18	7	39.1	I.	Ec.	Re.
16	12	5		I.	Tr.	In.
	13	3		I.	Sh.	In.
	14	25		I.	Tr.	Eg.
	15	23		I.	Sh.	Eg.
	20	28		IV.	Oc.	Dis.
17	1	20		IV.	Oc.	Re.
	5	25	17.0	IV.*	Ec.	Dis.
	5	57		II.*	Oc.	Dis.
	9	22		I.	Oc.	Dis.
	10	8	50.6	IV.	Ec.	Re.
	10	46	4.0	II.	Ec.	Re.
	12	36	23.0	I.	Ec.	Re.
18	6	36		I.	Tr.	In.
	7	32		I.	Sh.	In.
	8	56		I.	Tr.	Eg.
	9	52		I.	Sh.	Eg.
	18	40		III.	Tr.	In.
	22	22		III.	Tr.	Eg.
	22	23		III.	Sh.	In.
19	0	47		II.	Tr.	In.
	2	6		III.	Sh.	Eg.
	2	39		II.	Sh.	In.
	3	42		II.	Tr.	Eg.
	3	53		I.	Oc.	Dis.
	5	36		II.*	Sh.	Eg.
	7	5	8.9	I.	Ec.	Re.
20	1	6		I.	Tr.	In.
	2	0		I.	Sh.	In.
	3	26		I.	Tr.	Eg.
	4	20		I.	Sh.	Eg.
	19	22		II.	Oc.	Dis.
	22	23		I.	Oc.	Dis.
21	0	5	48.6	II.	Ec.	Re.
	1	33	53.3	I.	Ec.	Re.
21	19	36		I.	Tr.	In.
	20	29		I.	Sh.	In.
	21	56		I.	Tr.	Eg.
	22	49		I.	Sh.	Eg.
22	8	51		III.	Oc.	Dis.
	14	10		II.	Tr.	In.
	15	56		II.	Sh.	In.
	16	0	23.1	III.	Ec.	Re.
	16	53		I.	Oc.	Dis.
	17	6		II.	Tr.	Eg.
	18	53		II.	Sh.	Eg.
	20	2	36.8	I.	Ec.	Re.
23	14	7		I.	Tr.	In.
	14	58		I.	Sh.	In.
	16	27		I.	Tr.	Eg.
	17	18		I.	Sh.	Eg.
24	8	47		II.	Oc.	Dis.
	11	23		I.	Oc.	Dis.
	13	24	27.0	II.	Ec.	Re.
	14	31	19.7	I.	Ec.	Re.
25	7	54		IV.	Tr.	In.
	8	37		I.	Tr.	In.
	9	27		I.	Sh.	In.
	10	57		I.	Tr.	Eg.
	11	47		I.	Sh.	Eg.
	12	47		IV.	Tr.	Eg.
	15	36		IV.	Sh.	In.
	20	32		IV.	Sh.	Eg.
	23	6		III.	Tr.	In.
26	2	25		III.	Sh,	In.
	2	48		III.	Tr.	Eg.
	3	34		II.	Tr.	In.
	5	14		II.*	Sh.	In.
	5	53		I.*	Oc.	Dis.
	6	8		III.	Sh.	Eg.
	6	30		II.	Tr.	Eg.
	8	11		II.	Sh.	Eg.
	9	0	4.4	I.	Ec.	Re.
27	3	7		I.	Tr.	In.
	3	56		I.	Sh.	In.
	5	27		I.*	Tr.	Eg.
	6	16		I.	Sh.	Eg.
	22	13		II.	Oc.	Dis.
28	0	24		I.	Oc.	Dis.
	2	44	11.9	II.	Ec.	Re.
	3	28	47.8	I.	Ec.	Re.
	21	37		I.	Tr.	In.
	22	25		I.	Sh.	In.
	23	57		I.	Tr.	Eg.
29	0	45		I.	Sh.	Eg.
	13	18		III.	Oc.	Dis.
	16	58		II.	Tr.	In.
	18	32		II.	Sh.	In.
	18	54		I.	Oc.	Dis.
	19	54		II.	Tr.	Eg.
	20	1	54.7	III.	Ec.	Re.
	21	29		II.	Sh.	Eg.
	21	57	30.2	I.	Ec.	Re.
30	16	8		I.	Tr.	In.
	16	54		I.	Sh.	In.
	18	28		I.	Tr.	Eg.
	19	14		I.	Sh.	Eg.
31	11	39		II.	Oc.	Dis.
	13	24		I.	Oc.	Dis.
	16	2	47.1	II.	Ec.	Re.
	16	26	12.1	I.	Ec.	Re.

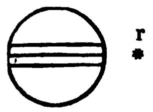
NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

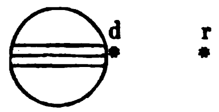
DECEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

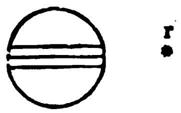
I.



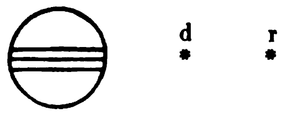
III.



II.

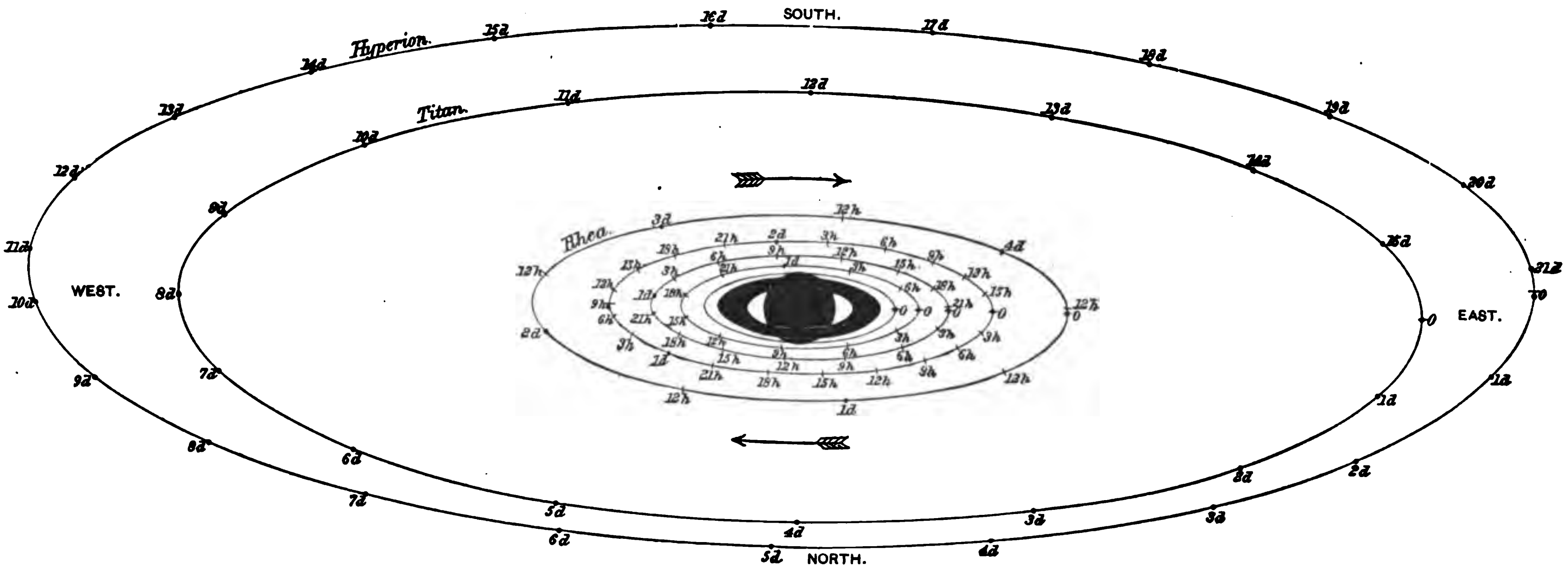


IV.



Configurations at 5ʰ 30ᵐ for an Inverting Telescope.

Day.	West.		East.
1	·1	○	2· ·3 ·4
2	·2	○	1· ·3 ·4
3		○	·2 3· ·4 ·1 ●
4	1·	○	3· 2· ·4
5	3· 2·	○	·1 4·
6	3· ·21·	○	4·
7	·3	○	·1 ·2 4·
8	·1	○	·3 2· 4·
9	2· 4·	○	1· ·3
10	4· ·1	○	3· ·2 ●
11	○ 1· 4·	○	3· 2·
12	4· 3· 2·	○	·1
13	·4 3· ·2 1·	○	
14	·4 ·3	○	·1 ·2
15	·4 ·1	○	2· ·3 ●
16	2· ·4	○	1· ·3
17	·1 ·2	○	·4 3·
18		○	1· 3· 2· ·4
19	3· 2·	○	·4 ·1 ●
20	3· ·2 1·	○	·4
21	·3	○	·1 2 4·
22	1· ·3	○	2· 4·
23	2·	○	1· ·3 4·
24	·1 ·2	○	4· ·3
25		○	4· 1· 3· 2
26	○ 2· 4· 3· ·1	○	
27	4· 3· ·2 1·	○	
28	4· ·3 ·1	○	·2
29	4· 3 1·	○	2·
30	·4 2·	○	·1 ·3
31	·4 ·1 2	○	·3



Names of the

Satellites.

- I. Mimas.
- II. Enceladus.
- III. Tethys.
- IV. Dione.
- V. Rhea.
- VI. Titan.
- VII. Hyperion
- VIII. Japetus.

APPARENT ORBITS OF THE SEVEN INNER SATELLITES OF SATURN,

AT OPPOSITION IN 1890,

AS SEEN IN AN INVERTING TELESCOPE.

Mean Synodic

Periods.

	d	h
I.	0	22.6
II.	1	8.9
III.	1	21.3
IV.	2	17.7
V.	4	12.5
VI.	15	23.3
VII.	21	7.8
VIII.	79	22.0

WASHINGTON MEAN TIMES OF GREATEST ELONGATION, ETC.

In the diagram on the preceding page, the points of the orbits marked "o" are those of the eastern elongation, as seen in an inverting telescope. The apparent positions of a satellite at any time may be marked on the diagram by counting around the orbit the interval in days and hours which has elapsed since the last east elongation. The times of these elongations may be found from the following tables. Mimas can only be seen within a few hours of each elongation: the time of every elongation visible at Washington is therefore given. The times of other elongations of any satellite in the same direction may be found by adding or subtracting any multiple of the period. For the three outer satellites the times of elongation and conjunction are given. The following abbreviations are used:—

E., East Elongation,
I., Inferior Conjunction (north of planet),
W., West Elongation,
S., Superior Conjunction (south of planet).

MIMAS.

Greatest Elongations Visible at Washington.

d h	d h	d h	d h	d h	d h
Jan. 1 13.2 E.	Jan. 28 9.6 W.	Feb. 26 14.7 W.	Mar. 31 14.2 W.	May 5 11.0 W.	Nov. 23 16.0 E.
2 11.8 E.	Feb. 1 15.5 E.	27 13.3 W.	Apr. 1 12.8 W.	6 9.6 W.	24 14.6 E.
3 10.4 E.	2 14.1 E.	28 11.9 W.	2 11.4 W.	7 8.2 W.	30 17.8 W.
7 16.1 W.	3 12.7 E.	Mar. 1 10.5 W.	3 10.0 W.	12 12.6 E.	Dec. 1 16.4 W.
8 14.7 W.	4 11.3 E.	6 14.9 E.	8 14.4 E.	13 11.2 E.	2 15.0 W.
9 13.3 W.	5 9.9 E.	7 13.5 E.	9 13.0 E.	14 9.8 E.	3 13.6 W.
10 11.9 W.	9 15.6 W.	8 12.1 E.	10 11.6 E.	21 11.5 W.	9 16.7 E.
11 10.5 W.	10 14.2 W.	9 10.7 E.	11 10.2 E.	22 10.1 W.	10 15.3 E.
15 16.3 E.	11 12.8 W.	10 9.3 E.	12 8.8 E.	23 8.7 W.	11 13.9 E.
16 14.9 E.	12 11.4 W.	14 15.2 W.	17 13.3 W.	29 11.9 E.	17 17.0 W.
17 13.6 E.	13 10.0 W.	15 13.8 W.	18 11.9 W.	30 10.5 E.	18 15.6 W.
18 12.1 E.	17 15.8 E.	16 12.4 W.	19 10.5 W.	31 9.1 E.	19 14.2 W.
19 10.7 E.	18 14.4 E.	17 11.0 W.	20 9.1 W.	June 7 10.9 W.	20 12.8 W.
23 16.6 W.	19 13.0 E.	18 9.6 W.	26 12.2 E.	8 9.5 W.	25 17.3 E.
24 15.2 W.	20 11.6 E.	23 14.0 E.	27 10.8 E.	Nov. 14 16.8 W.	26 15.9 E.
25 13.8 W.	21 10.2 E.	24 12.6 E.	28 9.4 E.	15 15.4 W.	27 14.5 E.
26 12.4 W.	22 8.8 E.	25 11.2 E.	29 8.0 E.	16 14.0 W.	28 13.1 E.
27 11.0 W.	25 16.1 W.	26 9.8 E.	May 4 12.4 W.	22 17.4 E.	29 11.7 E.

ENCELADUS.

d h	d h	d h	d h	d h	d h
Jan. 1 19.2 E.	Jan. 15 11.9 E.	Jan. 29 4.5 E.	Feb. 11 21.3 E.	Feb. 25 14.0 E.	Mar. 11 6.8 E.
3 4.1 E.	16 20.7 E.	30 13.4 E.	13 6.2 E.	26 22.9 E.	12 15.6 E.
4 13.0 E.	18 5.6 E.	31 22.4 E.	14 15.1 E.	28 7.8 E.	14 0.6 E.
5 21.9 E.	19 14.5 E.	Feb. 2 7.3 E.	16 0.0 E.	Mar. 1 16.7 E.	15 9.5 E.
7 6.8 E.	20 23.3 E.	3 16.1 E.	17 8.8 E.	3 1.5 E.	16 18.3 E.
8 15.7 E.	22 8.2 E.	5 1.0 E.	18 17.7 E.	4 10.4 E.	18 3.2 E.
10 0.6 E.	23 17.1 E.	6 9.9 E.	20 2.6 E.	5 19.3 E.	19 12.1 E.
11 9.3 E.	25 1.9 E.	7 18.7 E.	21 11.4 E.	7 4.2 E.	20 20.9 E.
12 18.2 E.	26 10.8 E.	9 3.6 E.	22 20.3 E.	8 13.1 E.	22 5.8 E.
14 3.0 E.	27 19.6 E.	10 12.5 E.	24 5.1 E.	9 21.9 E.	23 14.6 E.

WASHINGTON MEAN TIMES OF GREATEST ELONGATIONS.

ENCELADUS—(*Concluded.*)

	d h		d h		d h		d h		d h		d h
Mar.	24 23.6 E.	Apr.	14 12.9 E.	May	5 2.1 E.	May	25 15.4 E.	Nov.	22 14.2 E.	Dec.	13 3.6 E.
	26 8.5 E.		15 21.8 E.		6 11.0 E.		27 0.3 E.		23 23.1 E.		14 12.4 E.
	27 17.5 E.		17 6.6 E.		7 19.9 E.		28 9.3 E.		25 7.9 E.		15 21.2 E.
	29 2.4 E.		18 15.5 E.		9 4.8 E.		29 18.2 E.		26 16.8 E.		17 6.1 E.
	30 11.2 E.		20 0.3 E.		10 13.6 E.		31 3.0 E.		28 1.7 E.		18 15.0 E.
	31 20.1 E.		21 9.2 E.		11 22.5 E.	Nov.	8 21.2 E.		29 10.7 E.		19 23.9 E.
Apr.	2 5.0 E.		22 18.1 E.		13 7.4 E.		10 6.1 E.		30 19.6 E.		21 8.8 E.
	3 13.8 E.		24 3.1 E.		14 16.2 E.		11 14.9 E.	Dec.	2 4.4 E.		22 17.6 E.
	4 22.7 E.		25 12.0 E.		16 1.2 E.		12 23.8 E.		3 13.3 E.		24 2.5 E.
	6 7.5 E.		26 20.8 E.		17 10.0 E.		14 8.7 E.		4 22.2 E.		25 11.4 E.
	7 16.4 E.		28 5.7 E.		18 18.9 E.		15 17.7 E.		6 7.1 E.		26 20.4 E.
	9 1.3 E.		29 14.6 E.		20 3.8 E.		17 2.6 E.		7 16.0 E.		28 5.3 E.
	10 10.3 E.		30 23.5 E.		21 12.7 E.		18 11.4 E.		9 0.8 E.		29 14.2 E.
	11 19.2 E.	May	2 8.4 E.		22 21.6 E.		19 20.3 E.		10 9.7 E.		30 23.0 E.
	13 4.0 E.		3 17.2 E.		24 6.4 E.		21 5.2 E.		11 18.6 E.		32 7.9 E.

TETHYS.

	d h		d h		d h		d h		d h		d h
Jan.	2 3.0 E.	Feb.	8 20.7 E.	Mar.	18 14.5 E.	Apr.	25 8.3 E.	June	2 2.8 E.	Nov.	26 16.1 E.
	4 0.3 E.		10 18.0 E.		20 11.8 E.		27 5.7 E.		4 0.1 E.		28 13.4 E.
	5 21.6 E.		12 15.3 E.		22 9.1 E.		29 3.0 E.		5 21.4 E.		30 10.7 E.
	7 18.9 E.		14 12.6 E.		24 6.4 E.	May	1 0.3 E.		7 18.7 E.	Dec.	2 8.0 E.
	9 16.2 E.		16 9.9 E.		26 3.7 E.		2 21.6 E.		9 16.0 E.		4 5.3 E.
	11 13.5 E.		18 7.1 E.		28 1.0 E.		4 19.0 E.	Oct.	29 8.2 E.		6 2.6 E.
	13 10.8 E.		20 4.4 E.		29 22.3 E.		6 16.3 E.		31 5.5 E.		7 23.9 E.
	15 8.1 E.		22 1.7 E.		31 19.6 E.		8 13.6 E.	Nov.	2 2.8 E.		9 21.3 E.
	17 5.4 E.		23 23.0 E.	Apr.	2 16.9 E.		10 10.9 E.		4 0.1 E.		11 18.6 E.
	19 2.6 E.		25 20.2 E.		4 14.1 E.		12 8.2 E.		5 21.4 E.		13 15.9 E.
	20 23.9 E.		27 17.5 E.		6 11.4 E.		14 5.5 E.		7 18.8 E.		15 13.2 E.
	22 21.3 E.	Mar.	1 14.8 E.		8 8.7 E.		16 2.9 E.		9 16.3 E.		17 10.6 E.
	24 18.5 E.		3 12.1 E.		10 6.0 E.		18 0.2 E.		11 13.6 E.		19 7.9 E.
	26 15.8 E.		5 9.4 E.		12 3.3 E.		19 21.6 E.		13 10.9 E.		21 5.2 E.
	28 13.1 E.		7 6.7 E.		14 0.6 E.		21 18.9 E.		15 8.1 E.		23 2.5 E.
	30 10.3 E.		9 4.0 E.		15 21.9 E.		23 16.2 E.		17 5.5 E.		24 23.8 E.
Feb.	1 7.6 E.		11 1.3 E.		17 19.2 E.		25 13.5 E.		19 2.8 E.		26 21.1 E.
	3 4.8 E.		12 22.5 E.		19 16.4 E.		27 10.9 E.		21 0.1 E.		28 18.4 E.
	5 2.1 E.		14 19.8 E.		21 13.7 E.		29 8.2 E.		22 21.4 E.		30 15.7 E.
	6 23.4 E.		16 17.2 E.		23 11.0 E.		31 5.5 E.		24 18.8 E.		32 13.0 E.

DIONE.

	d h		d h		d h		d h		d h		d h
Jan.	1 4.6 E.	Feb.	3 0.4 E.	Mar.	7 20.1 E.	Apr.	9 15.9 E.	May	12 12.1 E.	Dec.	1 4.7 E.
	3 22.3 E.		5 17.9 E.		10 13.7 E.		12 9.6 E.		15 5.8 E.		3 22.4 E.
	6 16.0 E.		8 11.6 E.		13 7.4 E.		15 3.2 E.		17 23.6 E.		6 16.1 E.
	9 9.6 E.		11 5.2 E.		16 0.9 E.		17 20.9 E.		20 17.3 E.		9 9.8 E.
	12 3.3 E.		13 22.9 E.		18 18.7 E.		20 14.6 E.		23 10.9 E.		12 3.5 E.
	14 20.9 E.		16 16.5 E.		21 12.3 E.		23 8.3 E.	Nov.	12 0.8 E.		14 21.2 E.
	17 14.6 E.		19 10.2 E.		24 5.9 E.		26 1.9 E.		14 18.5 E.		17 14.9 E.
	20 8.2 E.		22 3.8 E.		26 23.6 E.		28 19.6 E.		17 12.1 E.		20 8.6 E.
	23 1.9 E.		24 21.5 E.		29 17.3 E.	May	1 13.3 E.		20 5.8 E.		23 2.3 E.
	25 19.5 E.		27 15.1 E.	Apr.	1 11.0 E.		4 7.0 E.		22 23.5 E.		25 20.1 E.
	28 13.2 E.	Mar.	2 8.8 E.		4 4.6 E.		7 0.7 E.		25 17.2 E.		28 13.7 E.
	31 6.7 E.		5 2.4 E.		6 22.3 E.		9 18.4 E.		28 11.0 E.		31 7.3 E.

RHEA.		TITAN.		HYPERION.	
d h	d h	d h	d h	d h	d h
Jan. 3 12.1 E.	Apr. 21 19.7 E.	Jan. 3 8.1 I.	Apr. 8 16.6 I.	Jan. 2 0.4 I.	May 9 22.6 I.
8 0.5 E.	26 8.1 E.	7 7.6 W.	12 16.1 W.	7 8.4 W.	15 6.5 W.
12 12.8 E.	30 20.6 E.	11 7.0 S.	16 15.6 S.	12 16.3 S.	20 14.4 S.
17 1.1 E.	May 5 9.0 E.	15 6.4 E.	20 15.3 E.	18 0.2 E.	25 22.5 E.
21 13.5 E.	9 21.4 E.	19 5.8 I.	24 15.0 I.	23 8.1 I.	31 6.4 I.
26 1.8 E.	14 10.0 E.	23 5.2 W.	28 14.6 W.	28 16.0 W.	June 5 14.3 W.
30 14.0 E.	18 22.5 E.	27 4.6 S.	May 2 14.2 S.	Feb. 3 0 0 S.	10 22.2 S.
Feb. 4 2.3 E.	23 10.9 E.	31 4.0 E.	6 13.9 E.	8 7.7 E.	16 6.4 E.
8 14.7 E.	27 23.5 E.	Feb. 4 3.3 I.	10 13.7 I.	13 15.5 I.	21 14.3 I.
13 2.9 E.	June 1 12.4 E.	8 2.5 W.	14 13.5 W.	18 23.3 W.	26 22 3 W.
17 15.2 E.	Nov. 2 7.5 E.	12 1.8 S.	Nov. 10 19.2 S.	24 7.3 S.	Oct. 20 23.1 E.
22 3.5 E.	6 20.1 E.	16 1.1 E.	14 19.2 E.	Mar. 1 15.4 E.	26 7.3 I.
26 15.7 E.	11 8.6 E.	20 0.4 I.	18 19.1 I.	6 23.2 I.	31 15.4 W.
Mar. 3 4.0 E.	15 21.2 E.	23 23.6 W.	22 19.1 W.	12 7.0 W.	Nov. 5 23.6 S.
7 16.4 E.	20 9.7 E.	27 22.8 S.	26 19.0 S.	17 15.1 S.	11 7.5 E.
12 4.6 E.	24 22.2 E.	Mar. 3 22.1 E.	30 19.0 E.	22 23.1 E.	16 15.4 I.
16 17.0 E.	29 10.7 E.	7 21.4 I.	Dec. 4 18.8 I.	28 6.9 I.	21 23.5 W.
21 5.4 E.	Dec. 3 23.2 E.	11 20.7 W.	8 18.6 W.	Apr. 2 14.8 W.	27 7.5 S.
25 17.7 E.	8 11.6 E.	15 20.0 S.	12 18.4 S.	7 22.8 S.	Dec. 2 15.4 E.
30 6.0 E.	13 0.0 E.	19 19.4 E.	16 18.3 E.	13 6.9 E.	7 23.3 I.
Apr. 3 18.4 E.	17 12.5 E.	23 18.8 I.	20 18.0 I.	18 14.7 I.	13 7.3 W.
8 6.6 E.	22 0.9 E.	27 18.2 W.	24 17.8 W.	23 22.6 W.	18 15.3 S.
12 19.0 E.	26 13.4 E.	31 17.7 S.	28 17.6 S.	29 6.6 S.	23 23.2 E.
17 7.4 E.	31 1.7 E.	Apr. 4 17.1 E.	32 17.5 E.	May 4 14.7 E.	29 7.1 I.

JAPETUS					
West Elongation . .	January 3	March 21	June 9	August 29	November 18
Superior Conjunction .	January 22	April 10	June 29	September 18	December 8
East Elongation . .	February 10	April 30	July 19	October 9	December 28
Inferior Conjunction .	March 2	May 20	August 9	October 29	

THE APPARENT ELEMENTS OF SATURN'S RINGS.

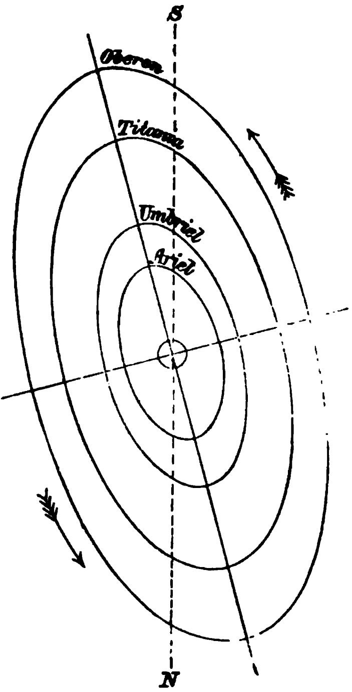
Greenwich Mean Noon.	a Outer Major Axis.	b Outer Minor Axis.	p Inclination of Northern Semi-Minor Axis to Circle of Declination from North to East.	l The Elevation of the Earth above the Plane of the Ring.	l' The Elevation of the Sun above the Plane of the Ring.	u Earth's Longitude from Saturn counted on Plane of Ring from the Ring's Ascending Node on Equator.	u' Ecliptic.
Jan. 0	43″.50	6″.16	− 6° 9′.4	− 8° 8′.1	− 10° 17′.4	210° 30′.6	167° 58′.5
20	44.66	6.91	− 6 14.9	− 8 53.9	− 9 59.4	209 12.5	166 40.2
Feb. 9	45.31	7.53	− 6 20.0	− 9 33.7	− 9 41.3	208 2.1	165 29.9
Mar. 1	45.29	7.96	− 6 24.3	− 10 7.0	− 9 23.2	207 0.5	164 28.3
21	44.63	8.15	− 6 28.1	− 10 31.4	− 9 5.0	206 6.1	163 33.8
Apr. 10	43.46	8.22	− 6 31.2	− 10 54.2	− 8 46.8	205 15.3	162 43.1
30	41.85	8.20	− 6 33.7	− 11 15.3	− 8 28.6	204 34.4	162 2.4
May 20	40.53	7.95	− 6 32.1	− 11 18.5	− 8 10.3	205 4.5	162 33.1
June 9	39.15	7.31	− 6 28.4	− 10 46.1	− 7 52.0	205 57.2	163 26.0
29	38.00	6.45	− 6 22.7	− 9 45.9	− 7 33.6	207 19.8	164 48.3
July 19	37.13	5.65	− 6 14.7	− 8 44.8	− 7 15.2	209 22.3	166 50.7
Aug. 8	36.59	4.89	− 6 5.6	− 7 41.1	− 6 56.7	211 25.7	168 54.1
28	36.37	4.17	− 5 55.7	− 6 35.2	− 6 38.2	213 30.0	170 58.4
Sept. 17	36.51	3.50	− 5 45.0	− 5 30.5	− 6 19.7	215 34.8	173 3.3
Oct. 7	36.98	2.87	− 5 34.9	− 4 27.0	− 6 1.2	217 39.9	175 8.3
27	37.79	2.27	− 5 25.5	− 3 24.7	− 5 42.6	219 45.3	177 14.0
Nov. 16	38.90	1.84	− 5 18.4	− 2 42.6	− 5 24.0	221 25.9	178 54.8
Dec. 6	40.24	1.62	− 5 13.0	− 2 18.2	− 5 5.4	222 30.6	179 59.6
26	41.71	1.55	− 5 10.6	− 2 7.5	− 4 46.9	222 39.6	180 8.4
31	42.07	1.58	− 5 10.7	− 2 9 0	− 4 42.2	222 39.7	180 8.0

The factor to be multiplied by *a* and *b* to obtain the axes of—

The inner ellipse of the outer ring = 0.8801 log factor = 9.9445
The outer ellipse of the inner ring = 0.8599 log factor = 9.9344
The inner ellipse of the inner ring = 0.6650 log factor = 9.8228
The inner ellipse of the dusky ring = 0.5486 log factor = 9.7392

NOTE.—The negative sign of l indicates that the visible surface of the ring is the southern one.

Date.	Position Angle.	App. Distances. Ariel.	App. Distances. Umbriel.
Jan. 16,	11°.2	14″.4	20″.0
Mar. 30,	11.6	15.1	21.0
June 30,	12.3	14.5	20.2



Date.	Position Angle.	App. Distances. Titania.	App. Distances. Oberon.
Jan. 16,	11°.2	32″.8	43″.9
Mar. 30,	11.6	34.6	46.2
June 30,	12.3	33.1	44.3

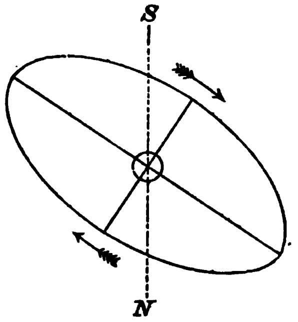
APPARENT ORBITS OF THE SATELLITES OF URANUS IN 1890,
AS SEEN IN AN INVERTING TELESCOPE.

WASHINGTON MEAN TIME OF GREATEST ELONGATION.

ARIEL.				UMBRIEL.				TITANIA.				OBERON.		
North.		South.		North.		South.		North.		South.		North and South.		
d	h	d	h	d	h	d	h	d	h	d	h	d	h	
Jan. 16	9.2	Jan. 20	3.9	Jan. 18	1.5	Jan. 15	23.8	Jan. 12	1.9	Jan. 16	10.4	Jan. 12	22.6	S.
23	22.6	27	17.4	26	8.4	24	6.7	20	18.9	25	3.3	19	16.2	N.
31	12.1	Feb. 4	6.8	Feb. 3	15.3	Feb. 1	13.6	29	11.8	Feb. 2	20.3	26	9.7	S.
Feb. 8	1.6	11	20.3	11	22.2	9	20.5	Feb. 7	4.7	11	13.2	Feb. 2	3.3	N.
15	15.0	19	9.7	20	5.2	18	3.4	15	21.7	20	6.2	8	20.9	S.
23	4.5	26	23.2	28	12.1	26	10.3	24	14.6	28	23.1	15	14.4	N.
Mar. 2	17.9	Mar. 6	12.7	Mar. 8	19.0	Mar. 6	17.2	Mar. 5	7.6	Mar. 9	16.1	22	8.0	S.
10	7.4	14	2.1	17	1.9	15	0.1	14	0.5	18	9.0	Mar. 1	1.6	N.
17	20.8	21	15.6	25	8.8	23	7.0	22	17.5	27	2.0	7	19.2	S.
25	10.3	29	5.0	Apr. 2	15.7	31	14.0	31	10.5	Apr. 4	18.9	14	12.7	N.
Apr. 1	23.8	Apr. 5	18.5	10	22.6	Apr. 8	20.9	Apr. 9	3.4	13	11.9	21	6.3	S.
9	13.2	13	7.9	19	5.6	17	3.8	17	20.4	22	4.8	27	23.9	N.
17	2.7	20	21.4	27	12.5	25	10.8	26	13.3	30	21.8	Apr. 3	17.5	S.
24	16.2	28	10.9	May 5	19.5	May 3	17.7	May 5	6.3	May 9	14.8	10	11.1	N.
May 2	5.6	May 6	0.4	14	2.4	12	0.6	13	23.3	18	7.7	17	4.6	S.
9	19.1	13	13.9	22	9.3	20	7.6	22	16.2	27	0.7	23	22.2	N.
17	8.6	21	3.4	30	16.3	28	14.5	31	9.2	June 4	17.7	30	15.8	S.
24	22.1	28	16.9	June 7	23.2	June 5	21.5	June 9	2.2	13	10.7	May 7	9.3	N.
June 1	11.6	June 5	6.3	16	6.2	14	4.4	17	19.2	22	3.7	14	2.9	S.
9	1.1	12	19.8	24	13.1	22	11.4	26	12.2	30	20.7	20	20.5	N.
16	14.6	20	9.3	July 2	20.1	30	18.4	July 5	5.2	July 9	13.7	27	14.1	S.
24	4.1	27	22.8	11	3.0	July 9	1.3	13	22.3	18	6.7	June 3	7.7	N.
July 1	17.6	July 5	12.3	19	10.0	17	8.3	22	15.3	26	23.7	10	1.3	S.
9	7.1	13	1.8	27	17.0	25	15.2	31	8.4	Aug. 4	16.7	16	18.9	N.
16	20.6	20	15.4	Aug. 4	23.9	Aug. 2	22.1	Aug. 9	1.4	13	9.8	23	12.5	S.

	d	h		d	h
Period of Ariel,	2	12.489	Period of Titania,	8	16.942
Period of Umbriel,	4	3.460	Period of Oberon,	13	11.119

Note.—For Ariel only every third elongation is given, and for Umbriel every alternate one. The intermediate ones may be found by adding multiples of the period of the satellite.



Date.	Position Angle.	Apparent Distance.
	°	″
Jan. 29,	237.6	16.6
Oct. 8,	241.5	16.8
Nov. 24,	240.6	16.8

APPARENT ORBIT OF THE SATELLITE OF NEPTUNE IN 1890,
AS SEEN IN AN INVERTING TELESCOPE.

WASHINGTON MEAN TIME OF GREATEST ELONGATION.

North East.			South West.			North East.			South West.			North East.			South West.		
	d	h		d	h		d	h		d	h		d	h		d	h
Jan.	2	15.8	Jan.	5	14.3	Aug.	31	12.3	Sept.	3	10.9	Oct.	29	7.4	Nov.	1	6.0
	8	12.9		11	11.4	Sept.	6	9.4		9	8.0	Nov.	4	4.6		7	3.1
	14	9.9		17	8.5		12	6.6		15	5.1		10	1.7		13	0.2
	20	7.0		23	5.5		18	3.7		21	2.2		15	22.8		18	21.3
	26	4.1		29	2.6		24	0.9		26	23.3		21	19.9		24	18.5
Feb.	1	1.2	Feb.	3	23.7		29	21.9	Oct.	2	20.4		27	17.0		30	15.6
	6	22.2		9	20.8	Oct.	5	19.0		8	17.6	Dec.	3	14.1	Dec.	6	12.7
	12	19.3		15	17.8		11	16.1		14	14.7		9	11.2		12	9.8
	18	16.4		21	14.9		17	13.2		20	11.8		15	8.4		18	6.9
	24	13.4		27	12.0		23	10.3		26	8.9		21	5.5		24	4.0
Mar.	2	10.5	Mar.	5	9.0								27	2.6		30	1.1

The above times are those of each passage of the satellite through an apsis of its apparent orbit. The position of the satellite at any other time may be found by measuring around the orbit from the apsis last passed through, remembering that the radius vector of the satellite describes equal areas in equal times.

Period of the satellite of Neptune, $5^d\,21^h.045$.

In the above diagrams, the central circle represents the planet, and is on the same scale as the orbits.

WASHINGTON MEAN TIME.

PLANETARY CONSTELLATIONS.

	d	h	m		°	′
Jan.	1	14	–	⊕ in Perihelion.		
	1	15	43	☌ ♆ ☽ .... ♆ +	1	5
	1	22	–	♀ in ☋		
	9	9	47	☌ ♄ ☽ .... ♄ —	3	8
	9	12	39	☌ ♃ ☉		
	13	8	–	☿ greatest elong. E.	18	51
	13	14	54	☌ ⛢ ☽ .... ⛢ —	4	36
	14	12	24	☌ ♂ ☽ .... ♂ —	3	12
	15	11	8	☿ in ☊		
	16	2	–	□ ⛢ ☉		
	18	16	12	☌ ♀ ♃ .... ♀ —	0	27
	19	15	–	☿ Stationary.		
	19	16	47	☌ ♃ ☽ .... ♃ +	1	32
	19	18	33	☌ ♀ ☽ .... ♀ +	1	9
	20	1	–	☿ in Perihelion.		
	21	4	38	☌ ☿ ☽ .... ☿ +	5	19
	29	0	34	☌ ☿ ☉ Inferior.		
	29	1	4	☌ ♆ ☽ .... ♆ +	1	3
	30	4	–	⛢ Stationary.		
	30	8	33	☿ greatest Hel. Lat. N.		
Feb.	5	7	–	♀ in Aphelion.		
	5	12	29	☌ ♄ ☽ .... ♄ —	2	53
	9	6	–	□ ♂ ☉		
	9	19	–	☿ Stationary.		
	9	21	14	☌ ⛢ ☽ .... ⛢ —	4	28
	10	11	–	♆ Stationary.		
	11	22	–	☌ ♂ ☽ .... ♂ —	2	2
	16	13	21	☌ ♃ ☽ .... ♃ +	2	5
	16	19	42	☌ ☿ ☽ .... ☿ +	3	50
	17	17	55	☌ ♀ ☉ Superior.		
	18	11	–	☍ ♄ ☉		
	18	15	45	☌ ♀ ☽ .... ♀ +	3	6
	19	17	–	□ ♆ ☉		
	22	19	52	☿ in ☋		
	23	5	–	☿ greatest elong. W.	26	50
	25	8	34	☌ ♆ ☽ .... ♆ +	0	51
	27	19	–	♀ greatest Hel. Lat. S.		
Mar.	4	11	–	☌ ♂ β Scorpii... ♂ +	0	8
	4	15	3	☌ ♄ ☽ .... ♄ —	2	44
	5	1	–	☿ in Aphelion.		
	9	1	42	☌ ⛢ ☽ .... ⛢ —	4	14
	12	2	13	☌ ♂ ☽ .... ♂ —	0	58
	16	7	1	☌ ♃ ☽ .... ♃ +	2	36
	18	17	24	☌ ☿ ☽ .... ☿ +	2	39
	19	22	25	☉ enters ♈, Spring com.		
	20	14	48	☌ ♀ ☽ .... ♀ +	4	4
	24	18	16	☌ ♆ ☽ .... ♆ +	0	34
	25	10	22	☿ greatest Hel. Lat. S.		
	31	20	20	☌ ♄ ☽ .... ♄ —	2	48
Apr.	5	6	49	☌ ⛢ ☽ .... ⛢ —	4	9
	8	14	14	☌ ☿ ☉ Superior.		
Apr.	8	19	23	☌ ♂ ☽ .... ♂ —	0	45
	12	20	3	☌ ♃ ☽ .... ♃ +	3	8
	13	10	22	☿ in ☊		
	14	0	–	☍ ⛢ ☉		
	18	0	–	☿ in Perihelion.		
	19	11	9	☌ ☿ ☽ .... ☿ +	4	55
	19	18	51	☌ ♀ ☽ .... ♀ +	3	14
	21	4	52	☌ ♆ ☽ .... ♆ +	0	21
	22	7	–	♂ Stationary.		
	23	1	12	♂ in ☋		
	25	1	29	♀ in ☊		
	25	11	2	☌ ☿ ♀ .... ☿ +	2	4
	28	2	11	☌ ♄ ☽ .... ♄ —	3	1
	28	7	45	☿ greatest Hel. Lat. N.		
	28	8	–	♄ Stationary.		
	30	13	–	□ ♃ ☉		
May	2	13	15	☌ ⛢ ☽ .... ⛢ —	4	15
	3	4	36	☌ ☿ ♆ .... ☿ +	4	14
	4	16	–	☌ ♀ ♆ .... ♀ +	2	2
	5	20	–	☿ greatest elong. E.	21	18
	6	3	8	☌ ♂ ☽ .... ♂ —	1	44
	9	14	–	☌ ☿ ♀ .... ☿ +	1	45
	10	5	48	☌ ♃ ☽ .... ♃ +	3	24
	17	16	–	□ ♄ ☉		
	18	5	–	☿ Stationary.		
	18	14	54	☌ ♆ ☽ .... ♆ +	0	13
	19	7	25	☌ ☿ ☽ .... ☿ +	1	42
	20	3	1	☌ ♀ ☽ .... ♀ +	1	9
	21	19	7	☿ in ☋		
	24	20	–	☌ ♆ ☉		
	25	11	22	☌ ♄ ☽ .... ♄ —	3	15
	27	2	9	☍ ♂ ☉		
	28	14	–	♀ in Perihelion.		
	29	12	7	☌ ☿ ☉ Inferior.		
	29	20	56	☌ ⛢ ☽ .... ⛢ —	4	24
	30	14	–	♃ Stationary.		
June	1	0	–	☿ in Aphelion.		
	1	23	32	☌ ♂ ☽ .... ♂ —	3	56
	4	14	–	♂ nearest to the Earth.		
	6	13	9	☌ ♃ ☽ .... ♃ +	3	26
	9	21	–	☌ ☿ ♆ .... ☿ —	2	38
	10	15	–	☿ Stationary.		
	14	19	38	☌ ♆ ☽ .... ♆ +	0	8
	15	0	35	☌ ☿ ☽ .... ☿ —	2	34
	16	–	–	☉ eclipsed, invis. at Wash.		
	19	10	56	☌ ♀ ☽ .... ♀ —	1	18
	19	11	40	♀ greatest Hel. Lat. N.		
	20	18	39	☉ enters ♋, Summer com.		
	21	9	37	☿ greatest Hel. Lat. S.		
	21	22	11	☌ ♄ ☽ .... ♄ —	3	24
	23	13	–	☿ greatest elong. W.	22	20

WASHINGTON MEAN TIME.

PLANETARY CONSTELLATIONS.

	d	h	m			°	′
June	26	5	8	☌ ⛢ ☽	.... ⛢ —	4	26
	28	21	20	☌ ♂ ☽	.... ♂ —	5	32
	30	4	–	⛢	Stationary.		
July	2	11	–	⊕	in Aphelion.		
	3	19	13	☌ ♃ ☽	.... ♃ +	3	12
	4	2	–	♂	Stationary.		
	10	9	37	☿	in ☊		
	12	7	7	☌ ♆ ☽	.... ♆ +	0	1
	14	13	–	□ ⛢ ☉			
	15	0	–	☿	in Perihelion.		
	15	14	22	☌ ☿ ☽	.... ☿ —	1	5
	16	23	28	☌ ♀ ♄	.... ♀ —	0	6
	19	9	57	☌ ♄ ☽	.... ♄ —	3	28
	19	15	31	☌ ♀ ☽	.... ♀ —	3	46
	22	5	11	☌ ☿ ☉	Superior.		
	23	13	10	☌ ⛢ ☽	.... ⛢ —	4	19
	25	6	58	☿	greatest Hel. Lat. N.		
	26	12	25	☌ ♂ ☽	.... ♂ —	5	22
	29	19	26	☍ ♃ ☉			
	31	0	50	☌ ♃ ☽	.... ♃ +	2	51
Aug.	8	14	12	☌ ♆ ☽	.... ♆ —	0	12
	9	11	48	☌ ☿ ♄	.... ☿ —	0	34
	14	14	41	♀	in ☋		
	15	22	22	☌ ♄ ☽	.... ♄ —	3	30
	16	18	52	☌ ☿ ☽	.... ☿ —	5	17
	17	18	23	☿	in ☋		
	18	16	12	☌ ♀ ☽	.... ♀ —	5	36
	19	21	1	☌ ⛢ ☽	.... ⛢ —	4	5
	23	17	8	☌ ♂ ☽	.... ♂ —	3	52
	27	6	32	☌ ♃ ☽	.... ♃ +	2	40
	27	23	–	☿	in Aphelion.		
	29	13	–	□ ♆ ☉			
	30	2	–	☌ ♄ ☉			
Sept.	1	18	–	☌ ♀ ⛢	.... ♀ —	2	6
	2	16	–	☿	greatest elong. E.	27	5
	4	22	–	☌ ♆ ☽	.... ♆ —	0	31
	9	3	–	♆	Stationary.		
	12	11	21	☌ ♄ ☽	.... ♄ —	3	33
	15	6	29	☌ ☿ ☽	.... ☿ —	9	10
	16	1	–	☿	Stationary.		
	16	5	20	☌ ⛢ ☽	.... ⛢ —	3	50
	17	8	52	☿	greatest Hel. Lat. S.		
	17	11	38	☌ ♀ ☽	.... ♀ —	6	12
	17	23	–	♀	in Aphelion.		
	21	4	–	□ ♂ ☉			
	21	4	56	☌ ♂ ☽	.... ♂ —	1	44
	22	9	6	☉	enters ♎, Autumn com.		
	23	11	–	♀	greatest elong. E.	46	34
	23	12	49	☌ ♃ ☽	.... ♃ +	2	45
	26	20	–	♂	greatest Hel. Lat. S.		
	27	19	–	♃	Stationary.		
Sept.	29	1	55	☌ ☿ ☉	Inferior.		
Oct.	2	6	10	☌ ♆ ☽	.... ♆ —	0	45
	6	8	53	☿	in ☊		
	7	11	–	☿	Stationary.		
	10	0	50	☌ ♄ ☽	.... ♄ —	3	40
	10	11	11	♀	greatest Hel. Lat. S.		
	10	23	–	☿	in Perihelion.		
	11	14	13	☌ ☿ ☽	.... ☿ —	3	56
	13	15	1	☌ ⛢ ☽	.... ⛢ —	3	39
	14	13	–	☿	greatest elong. W.	18	10
	16	19	43	☌ ♀ ☽	.... ♀ —	5	44
	19	19	26	☌ ♂ ☽	.... ♂ +	0	33
	19	19	31	☌ ⛢ ☉			
	20	20	28	☌ ♃ ☽	.... ♃ +	3	3
	20	22	25	♂	in Perihelion.		
	21	6	17	☿	greatest Hel. Lat. N.		
	26	9	–	□ ♃ ☉			
	28	20	–	♀	greatest brilliancy.		
	29	14	51	☌ ♆ ☽	.... ♆ —	0	53
	30	13	40	☌ ☿ ⛢	.... ☿ +	1	4
Nov.	6	14	9	☌ ♄ ☽	.... ♄ —	3	46
	10	2	24	☌ ⛢ ☽	.... ⛢ —	3	33
	11	13	35	☌ ☿ ☽	.... ☿ —	2	21
	13	4	–	♀	Stationary.		
	13	5	44	☌ ♂ ♃	.... ♂ —	0	59
	13	17	33	☿	in ☋		
	14	0	6	☌ ♀ ☽	.... ♀ —	4	2
	16	10	21	☌ ☿ ☉	Superior.		
	17	6	46	☌ ♃ ☽	.... ♃ +	3	25
	17	10	52	☌ ♂ ☽	.... ♂ +	2	39
	23	23	–	☿	in Aphelion.		
	25	22	37	☌ ♆ ☽	.... ♆ —	0	51
	26	23	–	☍ ♆ ☉			
	29	2	21	☌ ☿ ♀	.... ☿ +	0	10
Dec.	3	11	16	☌ ♀ ☉	Inferior.		
	4	2	3	☌ ♄ ☽	.... ♄ —	3	44
	5	18	15	♀	in ☊		
	7	14	40	☌ ⛢ ☽	.... ⛢ —	3	30
	8	7	–	□ ♄ ☉			
	10	13	27	☌ ♀ ☽	.... ♀ +	0	36
	11	–	–	☉	eclipsed, invis. at Wash.		
	12	11	41	☌ ☿ ☽	.... ☿ —	0	23
	14	7	51	☿	greatest Hel. Lat. S.		
	14	21	–	☌ ♃ ☽	.... ♃ +	3	44
	16	3	20	☌ ♂ ☽	.... ♂ +	4	14
	21	3	18	☉	enters ♑, Winter com.		
	23	4	46	☌ ♆ ☽	.... ♆ —	0	47
	23	8	–	♀	Stationary.		
	27	19	–	☿	greatest elong. E.	19	38
	28	0	–	♄	Stationary.		
	31	2	–		in Perihelion.		
	31	11	1	☌ ♄ ☽	.... ♄ —	3	32

POSITIONS OF OBSERVATORIES.

(*North Latitudes and West Longitudes are Considered Positive.*)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ.	Longitude	
				From Washington.	From Greenwich.
	° ′ ″	′ ″		h m s	h m s
Åbo . . .	+ 60 26 56.8	− 9 53.5	9.998902	− 6 37 18.45	− 1 29 6.41
Adelaide . . .	− 34 55 33.8	+ 10 47.6	9.999527	−14 22 32.34	− 9 14 20.30
Albany . . .	+ 42 39 49.5	− 11 28.2	9.999336	− 0 13 12.39	+ 4 54 59.65
Alfred (N. Y.) . .	+ 42 15 19.8	− 11 27.2	9.999346	+ 0 2 55.00	+ 5 11 7.04
Algier . . .	+ 36 45 2.7	− 11 1.6	9.999483	− 5 20 23.43	− 0 12 11.39
Allegheny . .	+ 40 27 41.6	− 11 21.6	9.999391	+ 0 11 50.89	+ 5 20 2.93
Altona . . .	+ 53 32 45.3	− 11 0.8	9.999063	− 5 47 58.39	− 0 39 46.35
Amherst . . .	+ 42 22 17.1	− 11 27.5	9.999343	− 0 18 7.37	+ 4 50 4.67
Annapolis . .	+ 38 58 53.5	− 11 15.0	9.999428	− 0 2 15.60	+ 5 5 56.44
Ann Arbor . .	+ 42 16 48.0	− 11 27.3	9.999346	+ 0 26 43.10	+ 5 34 55.14
Arcetri . . .	+ 43 45 14.4	− 11 29.9	9.999308	− 5 53 15.15	− 0 45 3.11
Armagh . . .	+ 54 21 12.7	− 10 54.9	9.999043	− 4 41 36.54	+ 0 26 35.5
Athens . . .	+ 37 58 20.0	− 11 9.4	9.999453	− 6 43 7.74	− 1 34 55.7
Beloit . . .	+ 42 30 9.0	− 11 27.8	9.999340	+ 0 47 55.26	+ 5 56 7.30
Berlin . . .	+ 52 30 16.7	− 11 7.7	9.999088	− 6 1 46.95	− 0 53 34.91
Berne . . .	+ 46 57 8.7	− 11 29.2	9.999227	− 5 37 58.04	− 0 29 46.0
Bethlehem . .	+ 40 36 23.9	− 11 22.2	9.999388	− 0 6 40.19	+ 5 1 31.85
Birr Castle . .	+ 53 5 47.0	− 11 3.9	9.999074	− 4 36 31.14	+ 0 31 40.9
Bologna . . .	+ 44 29 47.0	− 11 30.5	9.999289	− 5 53 36.64	− 0 45 24.6
Bonn . . .	+ 50 43 45.0	− 11 17.3	9.999132	− 5 36 35.33	− 0 28 23.29
Bordeaux . .	+ 44 50 16.7	− 11 30.7	9.999281	− 5 6 6.60	+ 0 2 5.44
Bothkamp . .	+ 54 12 9.6	− 10 56.0	9.999047	− 5 48 42.84	− 0 40 30.8
Breslau . . .	+ 51 6 56.5	− 11 15.4	9.999122	− 6 16 20.75	− 1 8 8.71
Brussels . . .	+ 50 51 10.5	− 11 16.8	9.999129	− 5 25 40.64	− 0 17 28.6
Cambridge (*England*)	+ 52 12 51.6	− 11 9.4	9.999095	− 5 8 34.79	− 0 0 22.75
Cambridge (*Mass.*) .	+ 42 22 47.6	− 11 27.6	9.999343	− 0 23 41.05	+ 4 44 30.99
Cape of Good Hope .	− 33 56 3.4	+ 10 39.0	9.999550	− 6 22 6.78	− 1 13 54.74
Chapultepec . .	+ 19 25 17.5	− 7 12.0	9.999841	+ 1 28 26.20	+ 6 36 38.24
Charkow . . .	+ 50 0 10.2	− 11 20.5	9.999150	− 7 33 6.74	− 2 24 54.7
Chicago . . .	+ 41 50 1.0	− 11 26.2	9.999357	+ 0 42 15.02	+ 5 50 27.06
Christiania . .	+ 59 54 43.7	− 10 0.2	9.998914	− 5 51 5.89	− 0 42 53.85
Cincinnati (*New Obs.*)	+ 39 8 19.5	− 11 15.8	9.999424	+ 0 29 29.25	+ 5 37 41.29
Cincinnati (*Old Obs.*)	+ 39 6 26.5	− 11 15.6	9.999425	+ 0 29 47.01	+ 5 37 59.05
Clinton . . .	+ 43 3 17.0	− 11 28.9	9.999326	− 0 6 34.65	+ 5 1 37.39
Coimbra . . .	+ 40 12 25.8	− 11 20.6	9.999398	− 4 34 37.54	+ 0 33 34.5
Copenhagen . .	+ 55 41 13.6	− 10 43.9	9.999011	− 5 58 30.96	− 0 50 18.92
Cordoba . . .	− 31 25 15.5	+ 10 13.5	9.999608	− 0 51 23.84	+ 4 16 48.2
Cracow . . .	+ 50 3 50.0	− 11 20.3	9.999149	− 6 28 2.41	− 1 19 50.37
Dantzig . . .	+ 54 21 18.0	− 10 54.9	9.999043	− 6 22 51.34	− 1 14 39.3
Dorpat . . .	+ 58 22 47.4	− 10 17.6	9.998948	− 6 55 5.54	− 1 46 53.5
Dresden . . .	+ 51 2 16.8	− 11 15.8	9.999124	− 6 3 6.88	− 0 54 54.84
Dublin . . .	+ 53 23 13	− 11 1.9	9.999066	− 4 42 50.04	+ 0 25 22
Düsseldorf . .	+ 51 12 25	− 11 15.0	9.999120	− 5 35 17.04	− 0 27 5
Dun Echt . .	+ 57 9 36	− 10 30.2	9.998977	− 4 58 32.04	+ 0 9 40.0
Durham . . .	+ 54 46 6.2	− 10 51.6	9.999033	− 5 1 52.24	+ 0 6 19.8
Edinburgh . .	+ 55 57 23.2	− 10 41.5	9.999005	− 4 55 28.99	+ 0 12 43.05
Florence . . .	+ 43 46 4.1	− 11 29.9	9.999308	− 5 53 13.54	− 0 45 1.5

POSITIONS OF OBSERVATORIES.

(*North Latitudes and West Longitudes are Considered Positive.*)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ.	Longitude	
				From Washington.	From Greenwich.
	° ′ ″	′ ″		h m s	h m s
Geneva . . .	+ 46 11 58.8	— 11 30.1	9.999246	— 5 32 48.81	— 0 24 36.77
Georgetown . .	+ 38 54 26.2	— 11 14.6	9.999430	+ 0 0 6.20	+ 5 8 18.24
Glasgow (*Missouri*) .	+ 39 13 45.6	— 11 16.2	9.999422	+ 1 3 5.93	+ 6 11 17.97
Glasgow (*Scotland*) .	+ 55 52 42.8	— 10 42.2	9.999006	— 4 51 1.44	+ 0 17 10.6
Göttingen . .	+ 51 31 47.9	— 11 13.3	9.999112	— 5 47 58.28	— 0 39 46.24
Gotha . . .	+ 50 56 37.5	— 11 16.3	9.999127	— 5 51 2.57	— 0 42 50.53
Greenwich . .	+ 51 28 38.4	— 11 13.6	9.999113	— 5 8 12.04	0 0 0
Hamburg . .	+ 53 33 7.0	— 11 0.8	9.999062	— 5 48 5.74	— 0 39 53.7
Hanover . . .	+ 43 42 15	— 11 29.8	9.999309	— 0 19 4.13	+ 4 49 7.91
Hastings-on-Hudson.	+ 40 59 25	— 11 23.6	9.999378	— 0 12 42.4	+ 4 55 29.64
Haverford . .	+ 40 0 40.1	— 11 19.8	9.999402	— 0 6 59.34	+ 5 1 12.70
Helsingfors . .	+ 60 9 43.3	— 9 57.1	9.998909	— 6 48 1.20	— 1 39 49.16
Hudson . . .	+ 41 14 42.6	— 11 24.4	9.999371	+ 0 17 32.12	+ 5 25 44.16
Ipswich . . .	+ 52 0 33.0	— 11 11.0	9.999100	— 5 13 7.84	— 0 4 55.80
Karlsruhe . .	+ 49 0 29.6	— 11 24.2	9.999175	— 5 41 48.55	— 0 33 36.51
Kasan . . .	+ 55 47 24.2	— 10 43.0	9.999009	— 8 24 40.94	— 3 16 28.9
Kew . . .	+ 51 28 6	— 11 13.6	9.999114	— 5 6 56.94	+ 0 1 15.1
Kiel . . .	+ 54 20 29.7	— 10 55.0	9.999043	— 5 48 47.80	— 0 40 35.76
Kiew . . .	+ 50 27 11.1	— 11 18.6	9.999139	— 7 10 12.68	— 2 2 0.64
Königsberg . .	+ 54 42 50.6	— 10 52.0	9.999034	— 6 30 10.95	— 1 21 58.91
Kremsmünster . .	+ 48 3 23.7	— 11 27.0	9.999199	— 6 4 44.24	— 0 56 32.2
Leiden . . .	+ 52 9 20.0	— 11 9.8	9.999097	— 5 26 8.39	— 0 17 56.35
Leipzig . . .	+ 51 20 6.3	— 11 14.3	9.999117	— 5 57 46.06	— 0 49 34.02
Leyton . . .	+ 51 34 34	— 11 13.0	9.999111	— 5 8 11.17	+ 0 0 0.87
Lisbon (*Marine Obs.*)	+ 38 42 17.6	— 11 13.5	9.999435	— 4 31 47.04	+ 0 36 25.0
Lisbon (*Royal Obs.*).	+ 38 42 31.3	— 11 13.6	9.999435	— 4 31 27.36	+ 0 36 44.68
Liverpool . .	+ 53 24 4	— 11 1.8	9.999066	— 4 55 54.84	+ 0 12 17.2
Lübec . . .	+ 53 51 31.2	— 10 58.6	9.999055	— 5 50 57.59	— 0 42 45.55
Lund . . .	+ 55 41 52.1	— 10 43.8	9.999011	— 6 0 57.07	— 0 52 45.03
Lyons . . .	+ 45 41 40.0	— 11 30.5	9.999259	— 5 27 19.90	— 0 19 7.86
Madison . . .	+ 43 4 37.0	— 11 28.9	9.999325	+ 0 49 24.11	+ 5 57 36.15
Madras . . .	+ 13 4 8.1	— 5 3.3	9.999926	—10 29 11.46	— 5 20 59.42
Madrid . . .	+ 40 24 30.0	— 11 21.4	9.999393	— 4 53 26.64	+ 0 14 45.4
Manheim . . .	+ 49 29 11.0	— 11 22.5	9.999163	— 5 42 2.56	— 0 33 50.52
Marburg . . .	+ 50 48 46.9	— 11 16.9	9.999130	— 5 43 17.04	— 0 35 5.0
Markree . . .	+ 54 10 31.8	— 10 56.2	9.999047	— 4 34 23.64	+ 0 33 48.4
Marseilles . .	+ 43 18 19.1	— 11 29.3	9.999320	— 5 29 46.68	— 0 21 34.64
Melbourne . .	— 37 49 53.3	+ 11 8.6	9.999456	—14 48 6.18	— 9 39 54.14
Mexico . . .	+ 19 26 1.3	— 7 12.2	9.999840	+ 1 28 14.63	+ 6 36 26.67
Milan . . .	+ 45 27 59.2	— 11 30.6	9.999265	— 5 44 58.01	— 0 36 45.97
Modena . . .	+ 44 38 52.8	— 11 30.6	9.999285	— 5 51 54.84	— 0 43 42.8
Montsouris . .	+ 48 49 18.0	— 11 24.8	9.999180	— 5 17 32.72	— 0 9 20.68
Moscow . . .	+ 55 45 19.8	— 10 43.3	9.999009	— 7 38 28.94	— 2 30 16.9
Mount Hamilton .	+ 37 20 23.5	— 11 5.5	9.999468	+ 2 58 22.05	+ 8 6 34.09
Munich . . .	+ 48 8 45.5	— 11 26.7	9.999197	— 5 54 38.17	— 0 46 26.13
Naples . . .	+ 40 51 45.4	— 11 23.1	9.999381	— 6 5 12.94	— 0 57 0.9
Nashville . .	+ 36 8 58.2	— 10 57.3	9.999497	+ 0 38 55.93	+ 5 47 7.97

POSITIONS OF OBSERVATORIES.

(*North Latitudes and West Longitudes are Considered Positive.*)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ.	Longitude	
				From Washington.	From Greenwich.
	° ′ ″	′ ″		h m s	h m s
Natal . . .	− 29 50 47.0	+ 9 55.2	9.999642	− 7 10 13.20	− 2 2 1.16
Neuchatel . .	+ 46 59 51.0	− 11 29.1	9.999226	− 5 36 2.24	− 0 27 50.2
New Haven . .	+ 41 18 36.5	− 11 24.6	9.999370	− 0 16 29.90	+ 4 51 42.14
New York (*Columb. Coll.*)	+ 40 45 23.1	− 11 22.7	9.999384	− 0 12 18.40	+ 4 55 53.64
New York (RUTHERFURD)	+ 40 43 48.5	− 11 22.6	9.999384	− 0 12 15.00	+ 4 55 57.04
Nice . . .	+ 43 43 16.7	− 11 29.8	9.999309	− 5 37 24.24	− 0 29 12.20
Nicolaeff . . .	+ 46 58 20.6	− 11 29.2	9.999226	− 7 16 6.14	− 2 7 54.1
Odessa . . .	+ 46 28 36	− 11 29.8	9.999239	− 7 11 14.34	− 2 3 2.3
Ogden . . .	+ 41 13 8.6	− 11 24.3	9.999372	+ 2 19 47.52	+ 7 27 59.56
Ó-Gyalla . . .	+ 47 52 43.4	− 11 27.4	9.999204	− 6 20 57.63	− 1 12 45.59
Olmütz . . .	+ 49 35 43	− 11 22.1	9.999160	− 6 17 14.64	− 1 9 2.6
Oxford (*Mississippi*)	+ 34 22 12.6	− 10 42.9	9.999540	+ 0 49 55.05	+ 5 58 7.09
Oxford (*Radcliffe*) .	+ 51 45 36.0	− 11 12.0	9.999106	− 5 3 9.44	+ 0 5 2.6
Oxford (*University*) .	+ 51 45 34.2	− 11 12.0	9.999106	− 5 3 11.64	+ 0 5 0.40
Padua . . .	+ 45 24 2.5	− 11 30.6	9.999266	− 5 55 41.17	− 0 47 29.13
Palermo . . .	+ 38 6 44	− 11 10.2	9.999449	− 6 1 37.04	− 0 53 25.0
Paramatta . .	− 33 48 49.8	+ 10 37.8	9.999553	− 15 12 18.24	− 10 4 6.2
Paris . . .	+ 48 50 11.8	− 11 24.8	9.999179	− 5 17 32.99	− 0 9 20.95
Philadelphia . .	+ 39 57 7.5	− 11 19.5	9.999404	− 0 7 33.58	+ 5 0 38.46
Plonsk . . .	+ 52 37 40.0	− 11 6.9	9.999085	− 6 29 44.05	− 1 21 32.01
Pola . . .	+ 44 51 49.0	− 11 30.6	9.999280	− 6 3 35.22	− 0 55 23.18
Portsmouth . .	+ 50 48 3.0	− 11 17.0	9.999130	− 5 3 48.14	+ 0 4 23.90
Potsdam . . .	+ 52 22 56	− 11 8.4	9.999091	− 6 0 29.04	− 0 52 17
Poughkeepsie . .	+ 41 41 18	− 11 25.8	9.999360	− 0 12 38.44	+ 4 55 33.6
Prague . . .	+ 50 5 18.8	− 11 20.2	9.999148	− 6 5 53.44	− 0 57 41.4
Princeton . .	+ 40 20 57.8	− 11 21.2	9.999394	− 0 9 34.54	+ 4 58 37.50
Pulkowa . . .	+ 59 46 18.7	− 10 1.8	9.998917	− 7 9 30.71	− 2 1 18.67
Quebec . . .	+ 46 48 17.3	− 11 29.4	9.999231	− 0 23 22.74	+ 4 44 49.3
Rio de Janeiro . .	− 22 54 23.8	+ 8 14.0	9.999782	− 2 15 30.63	+ 2 52 41.41
Rochester . .	+ 43 9 16.8	− 11 29.0	9.999324	+ 0 2 9.74	+ 5 10 21.78
Rome (*Coll. Rom.*) .	+ 41 53 53.6	− 11 26.3	9.999355	− 5 58 6.74	− 0 49 54.70
San Fernando . .	+ 36 27 41.5	− 10 59.5	9.999490	− 4 43 22.44	+ 0 24 49.6
Santiago de Chile .	− 33 26 42.0	+ 10 34.4	9.999561	− 0 25 25.74	+ 4 42 46.30
Schwerin . . .	+ 53 37 38.2	− 11 0.2	9.999061	− 5 53 52.74	− 0 45 40.7
Senftenberg . .	+ 50 5 10.1	− 11 20.2	9.999148	− 6 14 2.64	− 1 5 50.6
South Hadley . .	+ 42 15 18.2	− 11 27.3	9.999346	− 0 17 51.75	+ 4 50 20.29
Speier . . .	+ 49 18 55.4	− 11 23.2	9.999167	− 5 41 57.64	− 0 33 45.6
St. Louis . . .	+ 38 38 3.6	− 11 13.2	9.999437	+ 0 52 37.07	+ 6 0 49.11
St. Petersburg . .	+ 59 56 29.7	− 9 59.8	9.998913	− 7 9 25.54	− 2 1 13.5
Stockholm . .	+ 59 20 33.0	− 10 6.9	9.998927	− 6 20 26.04	− 1 12 14.00
Stonyhurst . .	+ 53 50 40	− 10 58.7	9.999055	− 4 58 19.36	+ 0 9 52.68
Strassburg (*New Obs.*)	+ 48 34 59.7	− 11 25.5	9.999186	− 5 39 16.69	− 0 31 4.65
Strassburg (*Old Obs.*)	+ 48 34 53.8	− 11 25.5	9.999186	− 5 39 14.53	− 0 31 2.49
Sydney . . .	− 33 51 41.1	+ 10 38.3	9.999552	− 15 13 1.58	− 10 4 49.54
Taschkent . .	+ 41 19 32.2	− 11 24.7	9.999369	− 9 45 22.84	− 4 37 10.80
Toulouse . . .	+ 43 36 47	− 11 29.7	9.999312	− 5 14 3.14	− 0 5 51.1
Turin . . .	+ 45 4 6.0	− 11 30.7	9.999275	− 5 39 0.44	− 0 30 48.4

POSITIONS OF OBSERVATORIES.

(*North Latitudes and West Longitudes are Considered Positive.*)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ.	Longitude	
				From Washington.	From Greenwich.
	° ′ ″	′ ″		h m s	h m s
Twickenham . .	+ 51 27 4.2	− 11 13.7	9.999114	− 5 6 58.94	+ 0 1 13.1
Univ. of Virginia .	+ 38 2 1.2	− 11 9.8	9.999448	+ 0 5 48.68	+ 5 14 00.72
Upsala . . .	+ 59 51 31.5	− 10 0.8	9.998915	− 6 18 42.23	− 1 10 30.19
Utrecht . . .	+ 52 5 10.5	− 11 10.2	9.999098	− 5 28 43.74	− 0 20 31.7
Venice . . .	+ 45 25 49.5	− 11 30.6	9.999266	− 5 57 37.44	− 0 49 25.4
Vienna (*Josephstadt*)	+ 48 12 53.8	− 11 26.6	9.999195	− 6 13 37.34	− 1 5 25.3
Vienna (*New Obs.*) .	+ 48 13 55.4	− 11 26.5	9.999195	− 6 13 33.26	− 1 5 21.22
Vienna (*Old Obs.*) .	+ 48 12 35.5	− 11 26.6	9.999195	− 6 13 43.78	− 1 5 31.74
Warsaw . . .	+ 52 13 5.7	− 11 9.4	9.999095	− 6 32 19.44	− 1 24 7.4
Washington . .	+ 38 53 38.8	− 11 14.5	9.999430	0 0 0	+ 5 8 12.04
West Point . .	+ 41 23 31	− 11 24.9	9.999368	− 0 12 22.71	+ 4 55 49.33
Wilhelmshaven .	+ 53 31 52.0	− 11 0.9	9.999063	− 5 40 47.25	− 0 32 35.21
Williamstown (*Mass.*)	+ 42 42 49	− 11 28.3	9.999334	− 0 15 18.6	+ 4 52 53.44
Williamstown (*Victoria*)	− 37 52 7.2	+ 11 8.8	9.999455	−14 47 50.84	− 9 39 38.8
Wilna . . .	+ 54 41 0	− 10 52.3	9.999035	− 6 49 23.94	− 1 41 11.9
Windsor . . .	− 33 36 28.9	+ 10 35.9	9.999558	−15 11 32.81	−10 3 20.77
Zürich . . .	+ 47 22 40.0	− 11 28.5	9.999216	− 5 42 24.64	− 0 34 12.6

ON THE ARRANGEMENT AND USE OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

PART I—THE EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

THE greater portion of this Ephemeris, embracing the positions of the sun and moon; the distances of the moon from the centres of the sun and the four most conspicuous planets, and from certain fixed stars; the ephemerides of the planets Mercury, Venus, Mars, Jupiter, and Saturn, is designed for the special use of navigators. The remainder contains the ephemerides of Uranus and Neptune, the heliocentric co-ordinates of the seven major planets, the rectangular equatorial co-ordinates of the sun, the moon's longitude and latitude, data for the libration of the moon, the obliquity of the ecliptic, the equation of the equinoxes, etc.

TIME.

Astronomers make use of several different kinds of time: mean solar time; true, or apparent solar time; and sidereal time.

Solar Time.—Solar time is that used for all the purposes of ordinary life, and is measured by the daily motion of the sun. A *Solar Day* is the interval of time between two successive transits of the sun over the same meridian; and the hour-angle of the sun is called *Solar Time.* This is the most natural and direct measure of time. But the intervals between the successive returns of the sun to the same meridian are not exactly equal, owing to the varying motion of the earth around the sun, and to the obliquity of the ecliptic. The intervals between the sun's transits over the meridian being unequal it is impossible to regulate a clock or chronometer so that it shall accurately follow the sun.

To avoid the irregularity which would arise from using the true sun as the measure of time, a fictitious sun, called the *Mean Sun*, is supposed to move in the equator with a uniform velocity. This mean sun is supposed to keep, on the average, as near the real sun as is consistent with perfect uniformity of motion; it is sometimes in advance of it, and sometimes behind it, the greatest deviation being about 16 minutes of time.

Mean Solar Time, which is perfectly equable in its increase, is measured by the motion of this mean sun. The clocks in ordinary use and the chronometers used by navigators are regulated to mean solar time.

True, or *Apparent Solar Time* is measured by the motion of the real sun.

The difference between apparent and mean time is called the *Equation of Time.* By means of it, we change apparent to mean time, or the reverse. Thus, if the apparent time be given, the mean time corresponding to it will be obtained by adding or subtracting the equation of time, according to the precept at the head of the column in which it is found, on page I of the Calendar for each month. If the mean time be given, the apparent time is obtained by applying the equation of time as directed by the precept on page II of the Calendar.

Sidereal Time.—Sidereal time is measured by the daily motion of the stars; or, as it is used by astronomers, by the daily motion of that point in the equator from which the true right ascension of the stars is counted. This point is the vernal equinox, and its hour-angle is called *Sidereal Time.* Astronomical clocks, regulated to sidereal time, are called sidereal clocks.

A *Sidereal Day* is the interval of time between the transit of the vernal equinox over the meridian, and its next succeeding return to the same meridian. It is about $3^m\ 56^s$ shorter than the mean solar day; 365¼ solar days, or a year, being divided into 366¼ sidereal days. It is divided into 24 hours. The sidereal hours are counted from 0 to 24, commencing with the instant of the passage of the true vernal equinox over the upper meridian, and ending with its return to the same meridian. About March 21st of each year the sidereal clock agrees with the mean time, or ordinary clock, and the former gains on the latter about $3^m\ 46^s$ per day, so that at the end of a year it will have gained an entire day, and will again agree with the mean time clock.

Day.—The *Civil Day*, according to the customs of society, commences at midnight, and comprises twenty-four hours from one midnight to the next following. The hours are counted from 0 to 12 from midnight to noon, after which they are again reckoned from 0 to 12 from noon to midnight. Thus the day is divided into two periods of 12 hours each, of which the first is marked A. M., and the last is marked P. M.

The *Astronomical Day* commences at noon on the civil day of the same date. It also comprises twenty-four hours, but they are reckoned from 0 to 24, and from the noon of one day to that of the next following. The astronomical as well as the civil time may be either apparent or mean, according as it is reckoned from apparent noon or from mean noon.

The civil day begins twelve hours before the astronomical day; therefore the first period of the civil day answers to the last part of the preceding astronomical day, and the last period of the civil day corresponds to the first part of the same astronomical day. Thus, January 9th, 2 o'clock, A. M., civil time, is January 8th, 14^h, astronomical time; and January 9th, 2 o'clock, P. M., civil time, is also January 9th, 2^h, astronomical time. The rule, then, for the transformation of civil time into astronomical time is this:—*If the civil time is marked A. M., take one from the day and add twelve to the hours, and the result is the astronomical time wanted; if the civil time is marked P. M., take away the designation P. M., and the astronomical time is had without further change.*

To change astronomical to civil time, we simply write P. M. after it, if it is less than 12 *hours. If greater than* 12 *hours, we subtract* 12 *hours from it, add* 1 *to the days, and write A. M.* For example, January 3d, 23 hours, astronomical time, is January 4th, 11 o'clock, A. M. civil time.

If the longitude from Greenwich be expressed in time, and, when *west*, *added* to the local time, or, when *east*, *subtracted* from the local time, the result is the corresponding Greenwich time. If the local mean time is used, the result is the Greenwich mean time, which ordinarily is that required for the use of this Ephemeris. The rule is the same, whether we use mean or sidereal time.

THE CALENDAR.

The Calendar is divided into twelve months, and to each month are assigned eighteen pages, the contents of which are as follow:—

Page I contains, for Greenwich apparent noon of each day, *The Sun's Apparent Right Ascension* and *Declination*, and the *Equation of Time.* Adjoining columns contain the differences of these quantities for one hour. By multiplying this difference by the hours and parts of an hour from Greenwich apparent noon, and adding the amount to, or subtracting it from, the quantity at noon, according as that quantity is increasing or decreasing, we obtain the value of any quantity for any given Greenwich apparent time. The hourly differences are given for the instant of apparent noon at Greenwich, and, when greater accuracy is required, should be first interpolated for half the hours and parts of an hour of the Greenwich apparent time.

This page is chiefly used when the sun is observed on the meridian, and the local apparent time is $0^h 0^m 0^s$. The longitude from Greenwich expressed in time, if west, is at that instant the Greenwich apparent time, or time after Greenwich apparent noon; if east, it is time before

Greenwich apparent noon. The longitude of any place is therefore employed in reducing the quantities on this page to apparent noon at the place.

The right ascension of the sun thus reduced is the sidereal time of local apparent noon. The difference between it and the clock time of the meridian passage of the sun is the error of the clock on sidereal time.

The declination of the sun reduced to the meridian, or apparent noon, of the place, is required in finding the latitude from a meridian altitude of the sun.

As an example of the use of page I:—

Let the sun's declination be required at apparent noon, 1890, May 31, at a place whose longitude is 179° 40′, or $11^h\ 58^m\ 40^s$ east from Greenwich:

		h	m	s
Local apparent time	May 31,	0	0	0
Longitude from Greenwich (subtractive)		11	58	40
Greenwich apparent time	May 30,	12	1	20

Reducing the minutes and seconds to decimals of an hour, we find that this moment is $12^h.022$ after Greenwich apparent noon on May 30, or $11^h.978$ before Greenwich apparent noon on May 31.

On page 74 of the Ephemeris we find that the change of declination in one hour is

	″
May 30, at Greenwich apparent noon	22.09
May 31, at Greenwich apparent noon	21.14
Difference for one day	0.95

If we want to be very exact, we find the amount of this hourly difference for the time which is half way between Greenwich noon and the time of observation; that is, for 6 hours after Greenwich noon of the 30th, this being half of 12 hours. Six hours is 0.25 of a day; so the calculation is as follow:—

	″
Difference for one hour, May 30	22.09
Change for 0.25 of a day or 0″.95 × 0.25	0.24
Difference at 6 hours after noon	21.85

21″.85 × 12.022 = 262″.7 = 4′ 22″.7

		°	′	″
Declination at Greenwich noon, May 30	N.	21	48	32.6
Change in 12.022 hours (additive)			4	22.7
Sun's declination at time of observation	N.	21	52	55.3

When the time of observation is only a few hours before Greenwich noon, it may be better to count the longitude backward from this nearest noon. Thus, in the example just given, the time is $11^h.978$ before Greenwich noon of May 31; half this interval is about 0.25 of a day, and the hourly motion for the middle of the interval is 21″.38. Then, we find:—

		°	′	″
Declination at Greenwich noon, May 31	N.	21	57	11.5
Product of 21″.38 × 11.978 = 256″.2 (subtractive)			4	16.2
Sun's declination at time of observation	N.	21	52	55.3

It will always be well to make the calculation by both methods, as their agreement will show both to be right.

At sea it is ordinarily sufficient to have the declination to the nearest half minute, and the reduction may be found by Table V of Bowditch's *American Practical Navigator*.

The equation of time, as has been before explained, is the number of minutes and seconds to be added to or subtracted from the apparent time, or the time given by an observation of the sun, to obtain the mean time. The heading of the column directs the manner in which the equation is to be applied. When there is a change in the course of the month from addition to subtraction or the reverse (as in the months of April and June), the two different directions are separated by a line, while a corresponding line below points out the dates between which the change takes place. The equation of time, as given on page I, is the mean time of apparent noon, or the hour-angle of the mean sun at that instant.

The Sun's Semidiameter and the *Sidereal Time of Semidiameter Passing Meridian* are also given on page I. The sun's semidiameter is used in reducing the altitude of the upper or lower limb of the sun to the altitude of the centre; and in reducing the angular distance of the limb from the moon or some other object, to the distance from the centre of the sun. The sidereal time of semidiameter passing the meridian is employed in obtaining the passage of the sun's centre over the wires of a transit-instrument, when the passage of one limb only has been observed. The quantity found in this column is to be added to the time of transit of the first, or western, limb; and to be subtracted from the time of transit of the second, or eastern, limb.

Page II contains, for Greenwich mean noon of each day, *The Sun's Apparent Right Ascension*, and *Declination*, the *Equation of Time*, and the *Sidereal Time of Mean Noon*. The hourly changes of these quantities are also given, and may be used in reducing them to any Greenwich mean time. The hourly changes may be first interpolated for half the Greenwich time, when great precision is required, in the way described in explaining the calculation of the declination.

. The right ascension and declination on pages I and II are affected by aberration, and therefore denote the *apparent* position of the *true* sun. Page II is more conveniently used when the mean time is known. This is the case in most observations of the sun out of the meridian, when the times have been noted by a clock or chronometer regulated to mean time. The quantities on this page can be reduced to mean noon of any place by interpolating for the longitude, as in the example of the sun's declination on the preceding page.

The sun's declination is required for finding the latitude of the place, the local time, and the sun's azimuth and amplitude, from observations of the sun.

The equation of time is needed in finding the mean time from observations of the sun, and the latitude from observations out of the meridian. The heading of the column directs the manner in which it is to be applied to mean time to obtain the apparent time.

The equation of time, as given on page II, is the apparent time of mean noon; and is equivalent to the hour-angle of the true sun at the instant of mean noon.

The sidereal time of mean noon is also the right ascension of the mean sun at Greenwich mean noon. It may be reduced for the longitude, or to any Greenwich mean time, by using the hourly difference, $9^s.8565$; or by Table III, appended to this volume, for reducing intervals of mean solar to sidereal time. Table LI of Bowditch's *Navigator* may be used for the same purpose when only the nearest quarter of a second is required.

The sun's right ascension and the sidereal time of mean noon, or right ascension of the mean sun, are useful in converting mean time to sidereal time. We first find the Greenwich mean time, then the R. A. of the mean sun for this time, as last explained: this being added to the local mean time will give the sidereal time.

The sidereal time of mean noon, reduced for the longitude of the place, is also used in converting sidereal time to mean time. Subtracting the reduced value from the given sidereal time, gives the interval of sidereal time from noon. Subtracting from this the corresponding reduction of a sidereal interval to a mean time interval, in Table II, appended to this volume, or Table LII of Bowditch's *Navigator*, will give the mean time required. This reduction may also be found by multiplying $9^s.8296$ by the hours and parts of an hour of the given sidereal time.

As examples of the use of page II: —

1.—Let the sun's right ascension and the equation of time be required for 1890, May 15, $9^h\ 2^m\ 30^s$, A. M., mean time, at a place whose longitude is 100° 20′, or $6^h\ 40^m\ 40^s$, west of Greenwich.

		h	m	s
Local astronomical mean time . . .	May 14,	21	2	30
Longitude from Greenwich (additive)		6	40	40
Greenwich mean time	May 15,	3	43	10$=3^h.7194$

Sun's Right Ascension.	h m s	*Equation of Time.*	m s
May 15, Greenwich noon .	3 28 48.16	May 15, noon . .	3 51.32 (additive).
H. D. $9^{s}.882 \times 3.7194$ . .	+ 0 36.76	H. D. — $0^{s}.026 \times 3.72$	— 0.10
	3 29 24.92		3 51.22

In this case, the hourly differences interpolated to half the interval, or $1^{h}.9$ after noon, have been used. The equation of time in this example is additive to mean time. Its reduction could also have been found by Table VI, A., of Bowditch's *Navigator*, but to seconds only.

2.—If the sidereal time is required for the same date and time, we have:—

	h m s
May 15, Sidereal Time (at Greenwich mean noon)	3 32 39.48
Hourly difference $9^{s}.8565 \times 3.7194$	+ 0 36.66
Add the local astronomical mean time	21 2 30.00
The required sidereal time is (rejecting 24^{h})	0 35 46.14

The reduction 0^{m} $36^{s}.66$ could have been found in Table III corresponding to the Greenwich mean time 3^{h} 43^{m} 10^{s}. Also, by Table LI of Bowditch's *Navigator*, the reduction is 0^{m} $36^{s}.7$.

3.—On 1890, May 15, A. M., at a place whose longitude is 100° 10′ W., suppose the sidereal time to be 0^{h} 36^{m} $37^{s}.16$, and that the corresponding mean time is required.

The astronomical day is May 14; the longitude in time, + 6^{h} 40^{m} 40^{s}, or + $6^{h}.678$.

	h m s
May 14, Sidereal Time (at Greenwich mean noon)	3 28 42.93
The H. D. $9^{s}.8565 \times 6.678$, or the reduction for 6^{h} 40^{m} 40^{s} in Table III .	+ 1 5.82
The sidereal time of local mean noon	3 29 48.75
The given sidereal time (+ 24^{h}, if necessary for the following subtraction) .	24 36 37.16
Subtracting the first from the second gives the sidereal interval from noon .	21 6 48.41 = $21^{h}.11345$
— $9^{s}.8296 \times 21.11345$, or the reduction for 21^{h} 6^{m} $48^{s}.41$ in Table II . .	— 3 27.54
The required astronomical mean time is . . . May 14,	21 3 20.87

Page III contains, for Greenwich mean noon of each day, *The Sun's True Longitude* and *Latitude*, and the *Logarithm of the Radius Vector of the Earth.* The longitudes of the sun are the true longitudes, not corrected for aberration. The longitude is given in two columns, headed λ and λ'; λ representing the sun's longitude counted from the true equinox of the date; and λ', the same co-ordinate counted from the mean equinox of the beginning of the year, (January $0^{d}.0$). A column of hourly differences enables the computer to obtain the sun's longitude for any hour from noon. The hourly differences of the logarithm of the radius vector are likewise given. The latitude is referred to the ecliptic of the date.

The last column on page III contains the *Mean Time of Sidereal Noon;* that is, the number of hours, minutes and seconds after Greenwich mean noon when the first point of Aries passes the meridian of Greenwich. It may be reduced to any meridian by interpolating for the longitude, or to any Greenwich sidereal time by means of the hourly difference, — $9^{s}.8296$. The reduction, however, can be taken directly from Table II for reducing intervals of sidereal time to mean solar time; or, approximately, from Table LII of Bowditch's *Navigator.*

This column may be used in converting sidereal time to mean time instead of that on page II. As an illustration, let us take Example 3, above.

It is seen in advance that the sum of the mean time of sidereal noon and the given sidereal time is less than 24 hours. Were it more than 24 hours, the mean time of sidereal noon should be taken out for May 13, that is the preceding astronomical day.

	h m s
May 14, the mean time of Greenwich sidereal noon is . .	20 27 55.35
The H. D. — $9^{s}.8296 \times 6.678$, or the reduction for long., Table II	— 1 5.64
The mean time of local sidereal noon	20 26 49.71
Add the given sidereal time	0 36 37.16 = $0^{h}.6103$
The sum is	21 3 26.87
— $9^{s}.8296 \times 0.6103$, or the reduction for 0^{h} 36^{m} $37^{s}.2$ in Table II .	— 0 6.00
The required astronomical mean time . . May 14,	21 3 20.87

Page IV contains *The Moon's Semidiameter* and Equatorial *Horizontal Parallax*, for each mean noon and midnight at Greenwich. Columns adjoining those of the horizontal parallax give the change of this quantity in one hour, by means of which it can be reduced to any other Greenwich mean time, in the same way as the sun's declination and the equation of time in the preceding examples. The sign plus or minus prefixed to the hourly differences, shows whether the horizontal parallax is increasing or decreasing.

The reduction of the moon's semidiameter may be readily found by multiplying the reduction of the horizontal parallax by 0.272. It may also be obtained from Table XI of Bowditch's *Navigator*, or by simply computing the proportional part.

If, for example, the semidiameter of the moon is to be taken out for 1890, May 21, 10^h, P. M., Greenwich mean time, we see that the difference of the semidiameters at noon and midnight of May 21 is $3''$; then,

$$12^h : 10^h = 3'' : 2''.5,$$

which is the correction to be subtracted from the semidiameter at noon, because the semidiameter is decreasing. The moon's semidiameter then, for May 21, 10^h, is $14'\ 57''.7 - 2''.5$, or $14'\ 55''.2$.

The moon's semidiameter and horizontal parallax are required for all observations of the moon. When great precision is needed, the hourly differences should be first interpolated for half the interval of Greenwich time from noon or midnight, and a correction applied to the horizontal parallax for the latitude of the place of observation.

The *Mean Time of the Moon's Upper Transit at Greenwich*, which is given on page IV to tenths of a minute, is also accompanied with a column of differences for one hour of longitude, by means of which, having the longitude converted into time, the local time of the moon's meridian passage at any other place, may be computed. The reduction may be taken by simple inspection from Bowditch's Table XXVIII. The last column of this page contains the *Age* of the moon, or the time elapsed since the preceding new moon, to tenths of a day.

Pages V—XII contain *The Moon's Right Ascension*, and *Declination*, for each day and hour of Greenwich mean time. They are accompanied with columns of differences for one minute, which are also given at each hour. The Greenwich mean time, which is required for taking out these quantities, may be taken from a well-regulated chronometer, or obtained by applying the longitude converted into time, to the local mean time of the observer. The right ascension or declination is taken out for the day and hour of the Greenwich mean time; the *Diff. for 1 Minute* multiplied by the minutes and parts of a minute of the Greenwich time, and the product added to, or subtracted from the quantity, according as the quantity is increasing or decreasing.

Thus, suppose the moon's right ascension and declination are required for 1890, May 1, $10^h\ 10^m\ 30^s$, astronomical mean time at Greenwich:—

	Right Ascension.		*Declination.*
	h m s		° ′ ″
May 1, 10^h	12 25 5.32		N. 2 48 30.5
Diff. $1^s.9541 \times 10.5$	= + 20.52	$13''.212 \times 10.5$ =	− 2 18.7
May 1, $10^h\ 10^m\ 30^s$	12 25 25.84		N. 2 46 11.8

The differences interpolated for $5^m.2 = 0^h.09$ are, for the right ascension $1^s.9553$, and for the declination $13''.234$, which may be used for greater precision.

Page XII contains also the *Phases of the Moon* and the dates of the *Moon's Perigee and Apogee*, or least and greatest distances from the earth.

Pages XIII—XVIII contain the *Lunar Distances*, or the angular distances of the centre of the moon from the centre of the sun, and from the four larger planets and certain fixed stars, as they would appear to an observer at the centre of the earth. They are given for every third hour of Greenwich mean time, beginning at noon; the dates are therefore astronomical. All the distances that can be observed on the same day, are grouped together under that date; and the columns are read from left to right, across both pages of the same opening. The letter W. or E. is affixed to the name of the sun, planet or star, to indicate that it is on the west, or east side of the moon.

An observer on the earth's surface having measured a lunar distance, corrected it for errors of his instrument and for the semidiameter of the objects, and cleared it from the effects of refraction and parallax, finds the true or geocentric distance, that is, the distance as it would have appeared from the centre of the earth at the moment of observation. With this distance and the distances in the Ephemeris of the same bodies on the same day, the Greenwich mean time of the observation can be found.

To lessen the labor of computation, there is given in the Ephemeris, between every two successive distances, the logarithm of the seconds of time in which the distance changes 1″; or, as it is usually called, the *Proportional Logarithm of the Difference.* It is given for the middle instant of the two hours between which it is placed.

For computing the Greenwich time we have the following rule:—

Find in the Almanac the two distances between which the true distance falls; take out the nearer of these, the hours of Greenwich time over it, and the P. L. of Diff. between them.

Find the difference between the true distance and the distance taken from the Almanac; and from the proportional logarithm of this difference, as found in the Navigator, subtract the P. L. of Diff. taken from the Almanac.

The result is the proportional logarithm of an interval of time to be added to the hours of Greenwich time, taken from the Almanac, when the earlier Almanac-distance is used; to be subtracted from the hours of Greenwich time, when the later Almanac-distance is used.

Another method is, to add the common logarithm of the difference of the true and the Almanac-distances to the P. L. of Diff. of the Almanac; the sum will be the common logarithm of the correction to be applied to the hours of Greenwich time. The Table of *Logarithms of small Arcs in Space or Time,* given at the end of the volume for 1871, saves the operation of reducing degrees (or hours) and minutes to seconds, and the reverse.

As the P. L. of Diff. in the Ephemeris varies, the Greenwich time found by the methods just described may not be sufficiently exact. To correct it for such variation, or second difference, take the difference between the P. L. of Diff. used and the one which follows it in the Ephemeris, (or, more strictly, half the difference of the preceding and following ones). With this difference, and the first correction of the Greenwich time already found, enter Table I, appended to this volume, and take out the corresponding seconds, which are to be added to the approximate Greenwich time when the Prop. Logs. in the Ephemeris are decreasing; and subtracted when they are increasing.

Thus the Greenwich mean time of the observation can be obtained. If the observer has noted the time of observation by a chronometer, the difference of this chronometer-time and the Greenwich mean time will be the error of the chronometer on Greenwich time as found from the lunar distance. In this way lunar distances can be used as a check upon the chronometer. By a series of carefully observed lunar distances on both sides of the moon, the chronometer-error may generally be ascertained within 20 or 30 seconds.

If the observer has found the local mean time of observation from the observed altitude of one of the bodies, or by a watch regulated to that time by recent observations and corrected for change of longitude in the interval, the difference of this local time and the Greenwich time found from the lunar distance will be his longitude. A longitude derived by this method should always be considered as uncertain by 5′ or more.

As an example of finding the Greenwich mean time from a lunar distance, suppose that in 1890, May 12, the corrected distance of the moon's centre from that of *a* Aquilæ is 48° 12′:—

Corrected distance	48° 12′ 0″		
Distance in Ephemeris May 12, VI^h	48 26 19	P. L.	0.3860
Difference	0 14 19	P. L.	1.0994
	h m s	P. L.	0.7134
Time from VI^h (*before*)	—0 34 49.5		
Corr. for 2d Diff., Table I	+ 14.5		
Greenwich mean time May 12	5 25 25.0		

By a table of common logarithms, or a table of logarithms of small arcs, the reduction of the Greenwich time would be found thus:—

From Ephemeris	P.L.	0.3860
Diff. of distances, 14′ 19″ = 859″	log	2.9340
Red. of Greenwich time, $2089^s.5 = 0^h\ 34^m\ 49^s.5$	log	3.3200

The result is the same as by the previous method.

Pages 218—249 contain the geocentric ephemerides of the seven major planets. The positions are referred to the equator and true equinox of the date, and corrected for aberration; they are, therefore, apparent positions. All the data except meridian passage are given for the moment of Greenwich mean noon. The column *Meridian Passage* gives the hour, minute and tenth of that passage of the planet over the meridian of Greenwich which occurs next after the noon of the date.

The right ascension and declination of a planet are required whenever it has been observed for time, latitude or azimuth. The mode of reducing them to any instant of Greenwich mean time is the same as in the examples for the sun, previously given. The local mean time of passage across any other meridian can be found by dividing the daily differences by 24, and multiplying the quotient by the hours and fractions of the longitude of the place. The product is subtractive from the time of Greenwich passage when the place is east of Greenwich, and additive when west. The corrections can never exceed one-half the change for one day.

Pages 250—263 contain the heliocentric positions of the seven major planets, and the logarithms of their distances from the earth. The heliocentric longitude is reckoned, not from the true equinox, as in the preceding ephemerides, but from the mean equinox of the date. It is, therefore, necessary to apply nutation, if the longitude from the true equinox is required. The daily motion is given for the moment of Greenwich mean noon. The column *Reduction to Orbit* gives the correction to be applied to the heliocentric longitudes in order to obtain the longitude counted along the orbit of the planet. This longitude is equal to the distance of the node from the mean equinox, plus the distance of the planet from the node. The heliocentric latitude is counted from the moving plane of the ecliptic. The *Logarithm of Radius Vector* is the logarithm of the distance of the centre of the planet from that of the sun, at each Greenwich mean noon given in the first column. The last two columns give, in the same way, the logarithm of the true distance of the centre of the planet from that of the earth. The one column gives the quantity for the Greenwich noon indicated on the left hand side of the page, and the other for the noon which is midway between that date and the date next below it. In the case of Mercury, this intermediate date is mean noon of the day immediately following; in the case of Venus, Mars, Jupiter, and Saturn, it is mean noon of the second day following; and in the case of Uranus and Neptune, mean noon of the fourth day following.

Pages 264—271 contain the rectangular co-ordinates of the centre of the sun, referred to the centre of the earth as the origin, and to the true equator and equinox of each date as the circle and point of reference. Each co-ordinate is given first for Greenwich mean noon, and in the column following for mean midnight of the same day. The columns *Reduc. to Mean Eq'x of Jan.* 0 give the corrections to be applied to the co-ordinates for noon in order to obtain the corresponding co-ordinates referred to the mean equator and the mean equinox of January 0.

Pages 272—275 give the longitude and latitude of the moon for every Greenwich mean noon and midnight. Both quantities are referred to the true ecliptic and equinox of the date.

Pages 276 and 277 contain the position of the moon's equator and the mean longitude of the moon, and a table for computing the libration of the moon. The epochs of greatest libration of the moon, together with the formulæ or finding the libration in longitude and latitude are given on page 421.

Page 278 contains, for each tenth Greenwich mean noon, the values of the principal elements arising from the motion of the equinox, and also the aberration and parallax of the sun. The column *Apparent Obliquity of the Ecliptic* (Hansen) gives the true inclination of the earth's equator to the ecliptic, without correction for the terms depending on the moon's longitude. The *Equation of Equinoxes* is really the astronomical nutation; that given *In Longitude* is the correction to be applied to the longitude of the body referred to the mean equinox, in order to obtain that longitude as referred to the true equinox. When the correction is positive, the true longitudes are greater than those referred to the mean equinox; while the contrary is true when the correction has the negative sign. The equation *In R. A.* is equal to that in longitude, multiplied by the cosine of the obliquity of the ecliptic.

The next column gives the *Precession of Equinoxes in Longitude*, from January 0 to each of the dates following. *The Sun's Aberration* is the quantity which is to be applied to the true longitude of the sun in order to obtain its apparent longitude. The correction being negative shows that the apparent longitude as affected by aberration is always less than the true longitude. The *Sun's Equatorial Horizontal Parallax*, given in the next column, is the angle subtended by the radius of the earth's equator, as seen from the centre of the sun.

PART II—THE EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

Page 280 contains the formulæ for reducing the positions of the fixed stars, using the notation of Bessel, and the constants of Peters and Struve. The formulæ by which the star-numbers are computed are also given.

Pages 281—284 contain the logarithms of the *Besselian Star-Numbers*, *A*, *B*, *C*, *D*, for each Washington mean midnight. These numbers serve to reduce the mean place of a star at the beginning of the Besselian fictitious year to its apparent place at the dates for which the numbers are given. If used in accordance with the English and French notation, the pair of quantities *A* and *B* must be interchanged with the pair *C* and *D*; that is, *A* must be interchanged with *C*, and *B* with *D*. In the first column along with the solar day is given, for certain dates, the sidereal hour and tenth of midnight. The sidereal time for which any set of quantities is given can be found by interpolation from these numbers.

The following is an example of the reduction of a star to apparent place by the Besselian star-numbers:—

Computation of the apparent place of α Hydræ for 1890, *Feb.* 14, *for the upper transit at Washington.*

(Star-Catalogue)	log a	0.4699	log b	7.8690	log c	8.7159 *n*	log d	8.6315
(Page 281)	log A	9.2830 *n*	log B	9.2743 *n*	log C	1.1943 *n*	log D	1.0521
(Star-Catalogue)	log a'	1.1898 *n*	log b'	9.8032 *n*	log c'	9.7158	log d'	9.0407
	log Aa	9.7529 *n*	log Bb	7.1433 *n*	log Cc	9.9102	log Dd	9.6836
	log Aa'	0.4728	log Bb'	9.0775	log Cc'	0.9101 *n*	log Dd'	0.0928

		h m s		° ′ ″
Mean Place, 1890.0, (page 296)	$\alpha_0 =$	9 22 10.925	$\delta_0 =$	− 8 10 55.80
	$Aa =$	− 0.566	$Aa' =$	+ 2.97
	$Bb =$	− 0.001	$Bb' =$	+ 0.12
	$Cc =$	+ 0.813	$Cc' =$	− 8.13
	$Dd =$	+ 0.483	$Dd' =$	+ 1.24
	$E =$	− 0.003	$\tau\mu' =$	0.00
	$\tau\mu =$	0.000		
Apparent Place, 1890, *Feb.* 14,	$\alpha =$	9 22 11.651	$\delta =$	− 8 10 59.60

Pages 285—292 contain the *Independent Star-Numbers*, which can be used for the same purpose. The column τ gives the fraction of the year from the beginning of the fictitious year to each date. These quantities are connected with those of Bessel by the relations given on page 280, where are also found the formulæ and precepts for the application of both systems of numbers. In order to use the Besselian numbers, it is necessary to have the values of the star-constants, a, b, c, d, a', b', c', d'. The independent star-numbers are given in order that the apparent place of the star may be determined when it is not convenient to compute these numbers.

The following is an example of the reduction of a star to apparent place by the independent star-numbers: —

Computation of the apparent place of α Hydræ for 1890, *Feb.* 14, *for the upper transit at Washington.*

$\alpha_0 = 140^\circ\ 33'$ $\delta_0 = -\ 8^\circ\ 10'.9$

$G = 182^\circ\ 48'$ $G + \alpha_0 = 323^\circ\ 21'$

$H = 305\ \ 49$ $H + \alpha_0 = 86\ \ 22$

$\log \frac{1}{15}$	8.8239	$\log \frac{1}{15}$	8.8239	$\alpha_0 =$	$9^h\ 22^m\ 10^s.925$
$\log g$	0.5860	$\log h$	1.2852	$f =$	$-\ 0.593$
$\log \sin (G+\alpha_0)$	9.7759 *n*	$\log \sin (H+\alpha_0)$	9.9991	$(g) =$	$+\ 0.022$
$\log \tan \delta_0$	9.1577 *n*	$\log \sec \delta_0$	0.0044	$(h) =$	$+\ 1.296$
$\log (g)$	8.3435	$\log (h)$	0.1126	$\tau \mu =$	0 000
		Apparent R. A.,		$\alpha =$	9 22 11.650
$\log g$	0.5860	$\log h$	1.2852	$\delta_0 =$	$-\ 8^\circ\ 10'\ 55''.80$
$\log \cos (G+\alpha_0)$	9.9043	$\log \cos (H+\alpha_0)$	8.8019	$(g') =$	$+\ 3.09$
$\log (g')$	0.4903	$\log \sin \delta_0$	9.1532 *n*	$(h') =$	$-\ 0.17$
		$\log (h')$	9.2403 *n*	$(i) =$	$-\ 6.72$
				$\tau \mu' =$	0.00
$\log i$	0.8317 *n*	*Apparent Dec.,*		$\delta =$	$-\ 8\ 10\ 59.60$
$\log \cos \delta_0$	9.9956				
$\log (i)$	0.8273 *n*				

Pages 293—301 contain the mean places of three hundred and eighty-three stars, for the beginning of the fictitious year 1889, or the moment when the sun's mean longitude is 280°.

The annual variations are to be considered as the differential coefficients of each co-ordinate with respect to the time at the beginning of the year.

In order that the list of mean places of stars may serve the purpose of a working-catalogue for the convenient use of astronomers, the position of each of the northern circumpolar stars is given in duplicate, one position being for the upper and the other for the lower culmination. The positions for the lower culmination are marked S. P. In this case, the right ascensions are the sidereal times at which the star crosses the lower meridian; and, in order to have the expressions for the co-ordinates congruous in all cases, the declinations are counted from the equator through the north pole, and therefore exceed 90°. The time of observation and the setting of the circle, in order to find a star on the meridian, are then obtained uniformly for all the stars.

Beginning with the volume of 1882, the number of stars has been greatly increased, in order to make the list more useful to field-astronomers. In order to show at a glance these additional stars, they are indicated in the list by an asterisk.

Pages 302—313 contain the apparent positions of the four north polar stars, *α*, *δ* and *λ* Ursæ Minoris, and 51 Cephei, for every upper transit at Washington. They include the terms depending on the moon's longitude. The mean solar time of transit is given in the column *Mean Solar Date*, in order that each transit above and below the pole may be readily identified. Suppose, for example, that the transit of Polaris below the pole on January 26th is to be found, and we wish to know whether it precedes or follows the upper transit of the same date. On page 302, we find that the upper transit occurs January 26.2; the lower transit, therefore, occurs January 26.7. But, the lower transit following that of July 1st (page 308), does not take place until July 2.3. Hence, the lower transit of July 1st precedes the upper one of the same date. A transit occurring very nearly at noon may also be identified without a computation to ascertain the actual mean date, by simply noting the tenth of a day in the column of *Mean Solar Date.*

Pages 314—364 contain, for every tenth upper transit at Washington, the apparent places of those stars of the preceding list which are not marked with an asterisk. The mean solar date in each left hand column gives the day and tenth of the transit; so that each intermediate transit may be readily identified. Along with each co-ordinate is given, in small type, the change for ten days. This quantity is to be regarded as the differential coefficient corresponding to the dates for which the star-places are given.

Pages 365—376 contain the apparent right ascensions of all stars marked with an asterisk in the list of mean places. The apparent right ascension of each star is given only for that part of the year when it may readily be observed on the meridian. In the case of circumpolar stars, the right ascensions for lower, as well as upper, transit are given.

Pages 377—384 contain the apparent right ascension, declination, and semidiamter of the sun, and the sidereal time, all for Washington mean noon. Adjoining columns give the seconds of right ascension and of declination for apparent noon, that is, for the moment of transit of the sun's centre over the meridian of Washington. The hours and minutes of right ascension, and the degrees and minutes of declination are the same for both mean and apparent noon. In case they would have differed, the minute which would have been numerically larger is diminished by one, and the seconds increased by sixty, so that there is always a correspondence between the two numbers. The hourly motions in right ascension and declination are given for the moment of mean noon, but may be regarded as having the same values for apparent noon.

The *Equation of Time for Apparent Noon* is the correction to be applied to apparent time in order to obtain mean time. It is, therefore, mean time minus apparent time. Each number as given is the mean time of transit of the sun's centre over the meridian of Washington, counted from the nearest noon. The use of all the quantities is substantially the same as in the *Ephemeris for the Meridian of Greenwich.*

Pages 385—392 contain the right ascension, declination, semidiameter, and parallax of the moon, at the moment of transit over the meridian of Washington. The mean time given in the second column is that of transit of the moon's centre over this meridian. The differences for one hour of longitude are the amounts by which the local mean times of transit over a meridian one hour west of Washington exceed those given in the column *Mean Time of Transit*, supposing the rate of change to be uniform and equal to what it is at the moment of transit over the meridian of Washington. The next four columns need no especial explanation, except that the differences for one hour of longitude are computed as if the motion of the moon in right ascension were uniform. By means of them, the position of the moon can be computed with astronomical accuracy at the moment of transit over any meridian not exceeding one hour in longitude from that of Washington, by taking account of second differences. With greater longitudes of the place, the accuracy of the result obtained in this way will diminish. The columns of sidereal time of semidiameter passing meridian, etc., do not seem to need any explanation, except that they all refer to the moment of transit. The column *Bright Limbs* is given to indicate to the observer which limbs are illuminated. When two opposite limbs are both so nearly full that they can be well observed, both are indicated; and the one which is deficient is printed in smaller type. When the illumination is so nearly equal that no choice can be made between them, both are printed in large type.

Pages 393—411 contain the geocentric apparent right ascensions and declinations of the seven major planets and their semidiameters and horizontal parallaxes, for the moments of all those transits over the meridian of Washington which can be observed.

PART III—PHENOMENA.

This portion of *The American Ephemeris and Nautical Almanac* gives the principal astronomical phenomena of the year, reduced to Washington mean time, except in the case of the eclipses and the data for the rings of Saturn, which are given in Greenwich mean time.

Pages 415—420 inclusive contain the elements necessary for computing the eclipses of the sun which occur during the year

The eclipse-elements are given for the moment of conjunction of the sun and moon in right ascension. The subsequent tables and results are not, however, computed from these elements unchanged; but from the accurate positions of the two bodies as interpolated for each hour of the eclipse. The principal circumstances of each eclipse are as follow:—

On the line "Eclipse begins" is given the Greenwich mean time at which the earth first touches the moon's penumbra, and the longitude and latitude of the point of touching.

The "Central eclipse begins" when the axis of the moon's shadow first touches the earth, and the longitude and latitude of the point of touching follow.

"Central eclipse at noon" indicates the moment when the axis of the shadow is coincident with the plane of the meridian at the point of its intersection with the earth's surface. To the observer at this point, the eclipse will be central at the moment of apparent noon.

"Central eclipse ends" and "Eclipse ends" have the converse meaning of the beginning.

Maps of the Eclipses.—The regions in which each eclipse is visible, are shown upon the maps given in connection with them. From these maps may also be derived the approximate determination of the times of beginning and ending, and of the magnitude of the eclipses at any place. The dotted curves show the outlines of the shadow for each hour of Greenwich mean time and therefore pass through all the places where the eclipse begins or ends at that hour. To find at what hour the eclipse begins at any place, we determine by inspection between what pair of these curved lines the place is situated. The eclipse will then begin between these two hours of Greenwich mean time: the fraction of the hour may be determined by dividing the hour proportionally to the space which it represents on the map. This division may be a little more exact by allowing for the changes in this space as indicated by their varying width. The Greenwich mean time thus found must be reduced to local mean time by applying the longitude.

As an example, suppose we wish to find the time at which the eclipse of 1890, Dec. 11, begins at Hobart Town.

We compare the distance of the place from the curves of 14^h and 15^h and we find it to correspond to about 22 minutes, therefore the time of beginning is approximately $14^h\ 22^m$, which is probably correct to within 2 or 3 minutes. Changing to local mean time the result will be:—

			h	m
Greenwich mean time	**Dec. 11,**		**14**	**22**
Longitude East		+	**9**	**49.3**
Local mean time	**Dec. 12,**		**0**	**11.3**

In the case of total and annular eclipses, a rough estimate of the magnitude of the eclipse may be obtained from the position of the place relatively to the central line and to the limit. On the central line, the eclipse is annular or total, while on the limit, the limb of the moon only grazes that of the sun.

More Accurate Computations.—A more accurate determination of the phases as visible at any point of the earth's surface may be obtained from the Besselian elements which are given for every ten minutes of Greenwich mean time. Their geometric signification is as follows:—

Let us imagine a plane passing through the centre of the earth, perpendicular to the right line joining the centres of the sun and moon. This latter line is the axis of the moon's shadow, and the plane is called the *fundamental plane*. We take the intersection of this plane with that of the earth's equator as the axis of X, and the centre of the earth as the origin of co-ordinates. The axis of Y is perpendicular to that of X, and directed toward the north; x and y are then the co-ordinates of the point in which the axis of the shadow intersects the fundamental plane. The angle d, of which the sine and cosine are both given, is the declination of that point of the celestial sphere toward which the axis of the shadow is directed; this direction being that from the earth toward the moon and sun. The angle μ is the Greenwich hour-angle of this same point of the celestial sphere.

The quantities l and l' are the radii of the shadow-cones upon the fundamental plane, l corresponding to the penumbra, and l' to the umbra, or annulus. The notation is that of CHAUVENET's *Spherical and Practical Astronomy*, in which l' is regarded as positive for an annular, and negative for a total eclipse.

The angles f and f', the tangents of which are given, are the angles which the elements of the respective shadow-cones make with the axis of the shadow; or, they are the semi-angles of the two cones.

At the bottom of the table are given the logarithms of the change of x, y and μ, in one minute, in order to facilitate the interpolation to any required moment.

The method of computing the eclipse from the given elements is as follows: It is premised that the moments of beginning and ending are those at which the distance of the observer from the axis of the shadow or penumbra is equal to the radius of the latter at the point of observation. To find such distance and radius we compute—

(1) The co-ordinates, ξ, η and ζ, of the observer, at some assumed moment of Greenwich mean time, as near as practicable to the true time of the required phase, together with their variations for one minute.

(2) The co-ordinates x and y of the axis of the shadow at the same moment, which, with their variations for one minute, are taken from the tables of elements.

(3) Hence, the position and motion of the observer relative to the axis of the shadow.

(4) The radius of the penumbra or umbra at a distance from the fundamental plane equal to that of the observer.

(5) Then, assuming the motions to be uniform, we determine the time required for the observer to be brought to a distance from the axis of the shadow equal to this radius.

The formulæ and directions for the several steps in the computation are as follow:—

(1) Find the geocentric co-ordinates of the station referred to the earth's equator, which are represented by $\rho \cos \varphi'$ and $\rho \sin \varphi'$, ρ being the distance from the centre of the earth, and φ' the geocentric latitude. These may be obtained from geodetic tables, or may be computed from the following table by the formulæ—

$$\rho \cos \varphi' = F \cos \varphi$$

$$\rho \sin \varphi' = \frac{\sin \varphi}{G}$$

φ being, as usual, the geographic latitude.

Table for Computing the Geocentric Co-ordinates of a Place.

φ	Log F.		Log G.	
0°	0.00000		0.00302	
		1		2
5	0.00001		0.00300	
		4		3
10	0.00005		0.00297	
		5		5
15	0.00010		0.00292	
		8		8
20	0.00018		0.00284	
		9		9
25	0.00027		0.00275	
		11		11
30	0.00038		0.00264	
		12		12
35	0.00050		0.00252	
		12		13
40	0.00062		0.00239	
		13		13
45	0.00075		0.00226	
		13		13
50	0.00088		0.00213	
		13		12
55	0.00101		0.00201	
		12		12
60	0.00113		0.00189	
		11		11
65	0.00124		0.00178	
		9		9
70	0.00133		0.00169	
		8		8
75	0.00141		0.00161	
		5		6
80	0.00146		0.00155	
		4		3
85	0.00150		0.00152	
		1		1
90	0.00151		0.00151	

For the assumed Greenwich mean time of computation, take from the table of elements the values of $\sin d$, $\cos d$, and μ. Put:

λ, the longitude west from Greenwich. The co-ordinates of the observer will then be:—

$$\begin{aligned} \xi &= \rho \cos \varphi' \sin (\mu - \lambda) \\ \eta &= \rho \sin \varphi' \cos d - \rho \cos \varphi' \sin d \cos (\mu - \lambda) \\ \zeta &= \rho \sin \varphi' \sin d + \rho \cos \varphi' \cos d \cos (\mu - \lambda) \end{aligned}$$

and their variations in one minute of mean time will be:—

$$\begin{aligned} \xi' &= [7.63992]\, \rho \cos \varphi' \cos (\mu - \lambda) \\ \eta' &= [7.63992]\, \rho \cos \varphi' \sin d \sin (\mu - \lambda) = [7.63992]\, \xi \sin d \end{aligned}$$

ζ' is not wanted.

(2) The co-ordinates x and y of the axis of the shadow are taken from the tables of elements for the same assumed moment of Greenwich mean time, together with their variations for one minute, which are equal to one-tenth of the differences of two consecutive numbers. The variations for one minute we represent by x' and y'. Their logarithms are given at the foot of the tables.

(3) The distance m and position-angle M of the axis of the shadow relative to the observer, and the relative motions, n and N, are computed by the formulæ:—

$$\begin{aligned} m \sin M &= x - \xi \\ m \cos M &= y - \eta \\ n \sin N &= x' - \xi' \\ n \cos N &= y' - \eta' \end{aligned}$$

(4) The radius L of the shadow or penumbra at the distance ζ from the fundamental plane is computed by the formula

$$L = l - \zeta \tan f$$

l and f being found in the table of elements, and ζ computed in (1).

(5) If the time chosen for computation is exactly that of the beginning or end of the eclipse, we shall have—

$$m = L$$

But, as this condition can scarcely ever be fulfilled on a first trial, a correction τ to the assumed time is computed thus: Find the angle ψ from the equation,

$$\sin \psi = \frac{m \sin (M - N)}{L}$$

There will be two values to this angle, of which one will be in the first and the other in the second quadrant when $\sin \psi$ is positive, and one in the third and the other in the fourth when $\sin \psi$ is negative. But, simplicity will be gained by taking only that value of ψ for which $\cos \psi$ is positive. This value lies between the limits $+90°$ and $-90°$. The correction τ to the assumed time will be found in minutes, from—

For beginning: $$\tau = -\frac{m \cos (M - N)}{n} - \frac{L \cos \psi}{n}$$

For ending: $$\tau = -\frac{m \cos (M - N)}{n} + \frac{L \cos \psi}{n}$$

One such pair of values of τ cannot, however, give the times of both beginning and ending with accuracy. To attain accuracy we must, in commencing the computation, assume two times, one near that of beginning, and another near that of ending. These approximate times may be derived from the chart of the eclipse. The computation for the first assumed time will give a small value of τ which, applied to the assumed time, will give a nearly correct time for the beginning of the eclipse, and a large value which, added to the assumed time, will give an inaccurate time of ending. The computation for the second assumed time will give a small and nearly correct value of τ, to be applied to the assumed time for the end, and a large negative and inaccurate one to be subtracted for the beginning. We shall thus deduce two times of each phase only one of which is to be considered approximately correct.

The more accurate times of beginning and ending may now be taken in place of the first assumed ones, and the computation may be repeated from the beginning, leading to a pair of values of τ, which should be very small and accurate. Such a repetition of the computation will in general be advisable, to guard against accidental numerical errors. The following theorem will, however, enable us to obtain a second approximation to the true times of each phase without repeating the computation.

THEOREM.—*The error of each result is approximately proportional to the square of the correction* τ, *multiplied by the sine of the sun's hour-angle*, $(\mu-\lambda)$, *for the middle of the interval between the time of computation and that of the phase.*

To apply this theorem we find the two values of $\tau^2 \sin(\mu-\lambda)$ corresponding to the required phase. We then find the ratio of these quantities—which will commonly be a large number, and divide the difference of the results by this ratio. The quotient will be a correction to be applied to the more accurate result in such a way as to make it deviate yet more from the less accurate one. This correction should be positive in the local forenoon, and negative in the afternoon, and its value should never materially exceed $0^{\text{m}}.001\,\tau^2$.

Unless the times chosen for computation are unusually in error, say ten minutes or more, the corrected results thus obtained will be theoretically correct within less than a second. But to guard against numerical errors it is better, after making this final correction, to repeat the computations so far as to obtain new values of m and L for the corrected times. If these two quantities agree within a unit of the fourth place of decimals, the times employed are generally correct within a second of time. If they differ too widely, further corrections and computations may be made by the computer according to his own judgment.

It may be remarked that the uncertainty of the ephemerides is such that a prediction may be several seconds in error from this unavoidable cause alone.

Position-angle of Point of Contact.—The position-angle P, of the point of contact, reckoned from the north point of the sun's limb toward the east, is found by the formula

For beginning: $P = N - \psi \pm 180^\circ$
For end: $P = N + \psi$

it being assumed that, in each case, the value of ψ is taken between the limits ± 90°.

Computation of the Solar Eclipse of 1890, *June* 16—17, *for Port Suda Light-house, in the Island of Candia*

Latitude, $\varphi = +\ 35^\circ\,27'\,55''$
Longitude, $\lambda = -\ 24^\circ\ 9'\,30''$

Constants for the given place:—

$\rho \sin \varphi' = 9.76116$
$\rho \cos \varphi' = 9.91136$

From the Eclipse Chart the approximate times of the phases are found to be as follow:—

		d	h	m	
Beginning	June	16	20	0	Greenwich Mean Time.
Annulus			21	40	
Ending			23	30	

	Beginning.	Annulus.	Ending.
Greenwich Mean Time,	$20^{\text{h}}\ 0^{\text{m}}$	$21^{\text{h}}\ 40^{\text{m}}$	$23^{\text{h}}\ 30^{\text{m}}$
μ	$299^\circ\ 51'\ 12''$	$324^\circ\ 51'\ 6''$	$352^\circ\ 21'\ 0''$
λ	− 24 9 30	− 24 9 30	− 24 9 30
$\mu-\lambda$	324 0 42	349 0 36	16 30 30
$\rho \cos \varphi'$	9.91136	9.91136	9.91136
$\sin(\mu-\lambda)$	9.76909 *n*	9.28021 *n*	9.45355
$\log \xi$	9.68045 *n*	9.19157 *n*	9.36491
ξ	− 0.47912	− 0.15544	+ 0.23169

		Beginning.	Annulus.	Ending.
Greenwich Mean Time,		$20^h\ 0^m$	$21^h\ 40^m$	$23^h\ 30^m$
	$\rho \sin \varphi'$	9.76116	9.76116	9.76116
	$\cos d$	9.96275	9.96274	9.96274
		9.72391	9.72390	9.72390
	(1)	+ 0.52955	+ 0.52955	+ 0.52955
	$\rho \cos \varphi'$	9.91136	9.91136	9.91136
	$\sin d$	9.59884	9.59887	9.59890
	$\cos (\mu - \lambda)$	9.90802	9.99196	9.98174
		9.41822	9.50219	9.49200
	(2)	+ 0.26195	+ 0.31783	+ 0.31046
(1)−(2)	η	+ 0.26760	+ 0.21172	+ 0.21909
	$\rho \sin \varphi'$	9.76116	9.76116	9.76116
	$\sin d$	9.59884	9.59887	9.59890
		9.36000	9.36003	9.36006
	(3)	+ 0.22909	+ 0.22910	+ 0.22912
	$\rho \cos \varphi'$	9.91136	9.91136	9.91136
	$\cos d$	9.96275	9.96274	9.96274
	$\cos (\mu - \lambda)$	9.90802	9.99196	9.98174
		9.78213	9.86606	9.85584
	(4)	+ 0.60552	+ 0.73462	+ 0.71753
(3)+(4)	ζ	+ 0.83461	+ 0.96372	+ 0.94665
	const. log	7.63992	7.63992	7.63992
	$\rho \cos \varphi' \cos (\mu - \lambda)$	9.81938	9.90332	9.89310
	$\log \xi'$	7.45930	7.54324	7.53302
	ξ'	+ 0.002879	+ 0.003493	+ 0.003412
	const. log	7.63992	7.63992	7.63992
	$\log \xi$	9.68045 *n*	9.19157 *n*	9.36491
	$\sin d$	9.59884	9.59887	9.59890
	$\log \eta'$	6.91921 *n*	6.43036 *n*	6.60373
	η'	− 0.000830	− 0.0002694	+ 0.0004015
	$x - \xi$	− 0.52900	− 0.00205	+ 0.54666
	$y - \eta$	− 0.17331	− 0.00597	+ 0.10823
	$x' - \xi'$	+ 0.005626	+ 0.005014	+ 0.005095
	$y' - \eta'$	+ 0.001949	+ 0.001380	+ 0.0006985
	$m \sin M$	9.72346 *n*	7.31175 *n*	9.73772
	$m \cos M$	9.23882 *n*	7.77597 *n*	9.03435
	$\tan M$	0.48464	9.53578	0.70337
	M	251° 51′ 38″	198° 57′ 0″	78° 48′ 5″
	$\cos M$	9.49322 *n*	9.97580 *n*	9.28828
	$\log m$	9.74560	7.80017	9.74607
	$n \sin N$	7.75020	7.70018	7.70714
	$n \cos N$	7.28981	7.13988	6.84417
	$\tan N$	0.46039	0.56030	0.86297
	N	70° 53′ 34″	74° 36′ 42″	82° 11′ 37″
	$\cos N$	9.51500	9.42384	9.13298
	$\log n$	7.77481	7.71604	7.71119

		Beginning.	Annulus.	Ending.
Greenwich Mean Time,		20^{h} 0^{m}	21^{h} 40^{m}	23^{h} 30^{m}
$\log \zeta$		9.92149	9.98395	9.97619
$\tan f$		7.66294	7.66083	7.66294
		7.58443	7.64478	7.63913
		0.00384	0.00441	0.004356
l		0.56097	0.01519	0.561250
L		0.55713	0.01078	0.556894
$\sin(M-N)$		8.22763 n	9.91683	8.77211 n
$\log m$		9.74560	7.80017	9.74607
$\operatorname{colog} L$		0.25404	1.96752	0.25423
$\sin \psi$		8.22727 n	9.68452	8.77241 n
ψ		$-\ 0^{\circ}58'1''$	$28^{\circ}55'25''$	$-\ 3^{\circ}23'36''$
$\log \frac{m}{n}$		1.97079	0.08413	2.03488
$\cos(M-N)$		9.99994 n	9.75134 n	9.99924
		1.97073 n	9.83547 n	2.03412
$-\frac{m}{n}\cos(M-N)$		$+\ 93^{m}.482$	$+\ 0^{m}.6846$	$-108^{m}.172$
$\log L$		9.74596	8.03248	9.74577
$\cos \psi$		9.99994	9.94214	9.99923
$\operatorname{colog} n$		2.22519	2.26396	2.28881
		1.97109	0.25858	2.03381
$\frac{L\cos\psi}{n}$		$\mp 93^{m}.560$	$\mp 1^{m}.8137$	$\pm 108^{m}.098$
τ		$-0^{m}.078$	$-\ 1.1291$ $+\ 2.4983$	$-\ 0.074$
T	June 16^{d}, 20^{h}	0.000	21^{h} 40.0000	23^{h} 30.000
t	June 16, 19	59.922	21 38.8709 21 42.4983	23 29.926
λ	1	36.633	1 36.6333	1 36.633
Local Mean Time	June 16, 21	36.555	16^{d} 23 15.5042 23 19.1316	17^{d} 1 6.559
Duration of Annulus			3^{m} $37^{s}.6$	

Therefore we have finally

		d	h	m	s	
Beginning of the eclipse	June	16	21	36	33.3	Local Mean Time.
Beginning of annulus		16	23	15	30.3	
End of annulus		16	23	19	7.9	
End of the eclipse		17	1	6	33.5	

Angle of position:

	Beginning.		Ending.	
	°	′	°	′
N	70	53.6	82	11.6
ψ (+ 180)	179	2.0	− 3	23.6
P	251	51.6	78	48.0

Elements of Occultations.—Pages 422—447 give the elements for the prediction of the times of occultation of stars and planets by the moon. In the columns referring to the star, those headed *Red'ns from* 1890.0 give the quantities necessary to reduce the mean place of the star at the beginning of 1890 to its apparent place at the time of occultation. These reductions are sufficiently accurate to be definitive.

The quantities in the following five columns are all given for the moment of geocentric conjunction of the star and moon in right ascension. Let there be a line passing from the star through the centre of the moon, and let a plane perpendicular to this line pass through the centre of the earth: this plane will be the fundamental plane for the occultation. The system of co-ordinates is similar to that already described for eclipses. The cone circumscribing the moon and star may be regarded as a cylinder having everywhere the same diameter as the moon. This cylinder will intercept the fundamental plane in a circle of which the linear diameter will be the same as that of the moon.

The *Washington Mean Time* is the moment at which the two bodies are in geocentric conjunction in right ascension. At this moment the co-ordinate x of the axis of the cylinder on the fundamental plane has the value zero. The column *Hour-Angle H* gives the common geocentric hour-angle of the moon and star at the same moment, counted from the meridian of Washington—positive toward the west and negative toward the east. Column Y gives the co-ordinate y of the axis of the cylinder upon the fundamental plane at the same moment. Columns x' and y' give the hourly variation of x and y. The linear unit in these columns is the earth's equatorial radius. The limiting parallels, north and south, show the extreme limits of latitude within which the occultation will be visible.

By the aid of these elements, the Washington mean time of immersion and emersion of a star behind the limb of the moon may be computed for any part of the earth by a method nearly the same as that already explained for computing eclipses, only more simple.

We shall first show how to compute an isolated occultation for a particular place, assuming it to be visible at that place, and then show how all the occultations which will be visible at a place may be selected and computed by a more rapid process.

(1) The geocentric co-ordinates of the place, $\rho \sin \varphi'$ and $\rho \cos \varphi'$, are to be computed with three or four places of decimals by the formulæ,

$$\rho \sin \varphi' = \frac{\sin \varphi}{G}$$

$$\rho \cos \varphi' = F \cos \varphi$$

already given in connection with the eclipses.

As in the case of eclipses, it is necessary to have an approximate time of the phenomenon, corresponding to that obtained from the charts of the eclipses. The quantity H being the Washington west hour-angle of the two bodies at the moment of geocentric conjunction, $H - \lambda$ will be the local hour-angle of the star at this same moment. Let us call this angle h_0, putting

$$h_0 = H - \lambda$$

where λ is the longitude west of *Washington.*

The next step will then be to find the approximate moment of apparent conjunction in right ascension as seen from the place. An approximate correction to reduce the time and hour-angle for geocentric conjunction to those for apparent conjunction may be taken from Mr. DOWNES's table, on pages 450—451. This correction will have the same sign as h_0.

When this table is not available, the correction may be computed thus: Compute the quantities ξ_0, ξ' and τ from the formulæ,

$$\xi_0 = \rho \cos \varphi' \sin h_0$$

$$\xi' = [9.4192] \cos (h_0 + \tfrac{1}{8} h_0)$$

$$\tau = \frac{\xi_0}{x' - \xi'}$$

τ will then be the approximate interval between the times of geocentric and local conjunction.

By applying it to the Washington mean time of the former, as given with the elements, we shall have the Washington mean time of the latter within a few minutes.

The average duration of an occultation is about an hour. Thence, by adding $0^h.5$ to and subtracting it from the mean time of apparent conjunction, we shall have approximate times of the phases of immersion and emersion for farther computation. Let us then put,

$\tau_1 = \tau - 0^h.5$

$\tau_2 = \tau + 0^h.5$

T, the Washington mean time of geocentric conjunction in R. A.

d, the declination of the star.

(2) Compute for the moments $T + \tau_1$ and $T + \tau_2$ the following quantities, in which we write τ for each of the quantities τ_1 and τ_2. The latter, when used as angles, are to be changed to arc by multiplying by 15, and the minutes are to be further increased by one-sixth the number of degrees in order to reduce to the sidereal hour-angle.

$$\begin{aligned}
\xi &= \rho \cos \varphi' \sin (h_0 + \tau) \\
\eta &= \rho \sin \varphi' \cos d - \rho \cos \varphi' \sin d \cos (h_0 + \tau) \\
\xi' &= [9.4192]\ \rho \cos \varphi' \cos (h_0 + \tau) \\
\eta' &= [9.4192]\ \rho \cos \varphi' \sin d \sin (h_0 + \tau) = [9.4192]\ \xi \sin d \\
x &= x' \tau \\
y &= Y + y' \tau
\end{aligned}$$

Compute m, M, n and N from the equations

$$\begin{aligned}
m \sin M &= x - \xi \\
m \cos M &= y - \eta \\
n \sin N &= x' - \xi' \\
n \cos N &= y' - \eta' \\
n' &= \frac{n}{60} = [8.2218]\ n \\
\sin \psi &= [0.5650]\ m \sin (M - N)
\end{aligned}$$

Then, t_1 and t_2 from the equations

$$t_1 = -\frac{m}{n'} \cos (M - N) - \frac{[9.4350]}{n'} \cos \psi \quad \text{(Beginning.)}$$

$$t_2 = -\frac{m}{n'} \cos (M - N) + \frac{[9.4350]}{n'} \cos \psi \quad \text{(End.)}$$

The quantities t_1 and t_2 will then be the corrections in minutes to be applied to the respective times $T + \tau_1$ and $T + \tau_2$ to obtain the Washington mean times of the phases.

As in the case of eclipses, the small value of t_1 will give an accurate result for one phase, and the large value an inaccurate result for the other. Both accurate results may then be corrected by comparison with the inaccurate one, in the way described for eclipses, and a result obtained which will probably be correct within a fraction of a minute of time.

As a check upon the result, it will be advisable to compute ξ, η, x and y for the moments finally obtained. If the times are correct these quantities will fulfil the condition,

$$\sqrt{(x - \xi)^2 + (y - \eta)^2} = 0.2723$$

If $\log m \sin (M - N) = 9.4350$ nearly, a recalculation will generally be necessary to determine whether, numerically, $\sin \psi < 1$, or $\sin \psi > 1$. In the latter case, the impossible value of $\sin \psi$ indicates that an occultation at the given place is impossible, unless the computed distance from the moon's limb is within the errors of the ephemerides of the moon and star.

In such cases of near approach to the moon's limb, we may take $\psi = 90°$, or $270°$, according as $\sin (M - N)$ is positive or negative; and for finding the time of nearest approach,

$$t = -\frac{m \cos (M - N)}{n'}$$

Putting π for the moon's horizontal parallax, the distance from the moon's limb will be,

$$\pi \, [m \sin (M - N) - 0.2723]$$

disregarding the sign of $\sin (M - N)$; or, allowing for the augmentation of the semidiameter,

$$\pi \, [m \sin (M - N) - 0.2723] \, [1 + z \sin \pi]$$

where

$$z = \rho \cos \varphi' \cos d \cos (h_0 + \tau) + \rho \sin \varphi' \sin d$$

The position-angle P, of the line from the moon's centre to the star at the times of contact, reckoned from the north point toward the east, is given by the formulæ: —

$$P = N - \psi \qquad \text{for immersion,}$$
$$P = N + \psi \pm 180^\circ \qquad \text{for emersion,}$$

it being supposed that the value of ψ, in each case, is taken between the limits $\pm 90^\circ$.

To find the angle from the vertex, we compute the angle C from the formula,

$$\tan C = \frac{\xi + t\,\xi'}{\eta + t\,\eta'}$$

in which the value of t corresponding to the phase is to be used. Then

$$V = P - C$$

is the angle from the vertex, also reckoned from the north toward the east.

As an example of an isolated occultation, we will compute that of λ Sagittarii, on 1890, Aug. 25, for Ann Arbor, Mich., whose position is

$$\varphi = + 42^\circ \, 16'.8$$
$$\lambda = + \;\; 0^h \, 26^m.72$$

Constants for the given place,

$$\log \rho \sin \varphi' = 9.82561$$
$$\log \rho \cos \varphi' = 9.86981$$

From the table of elements, page 438, we have

$$H = + \, 0^h \, 3^m.1$$
$$h_0 = H - \lambda = - \, 0^h \, 23^m.62$$

From Downes's Table, pages 450—451, or from the formulæ on page 510, we find the correction to the Washington mean time of geocentric conjunction as given on page 438 to be $-9.^m73$, therefore the Washington mean time of apparent conjunction at the given place is $7^h \, 57^m.57$.

Assuming the duration to be one hour, we shall have by first subtracting and then adding 30 minutes, the corrections to be applied to the Washington mean time of geocentric conjunction to obtain the approximate Washington mean times of immersion and emersion to be used in the computation, thus:

$$\tau_1 = - \, 0^h \, 39^m.73 \qquad T + \tau_1 = \text{Aug. } 25, \; 7^h \, 27^m.57$$
$$\tau_2 = + \, 0^h \, 20^m.27 \qquad T + \tau_2 = \text{Aug. } 25, \; 8^h \, 27^m.57$$

		Immersion.	Emersion.
		h m	h m
Washington Mean Time,	Aug. 25,	7 27.57	8 27.57
	h_0	− 0 23.62	− 0 23.62
	τ (in sidereal time)	− 0 39.839	+ 0 20.292
	$h_0 + \tau$	− 1 3.459	− 0 3.328
	$h_0 + \tau$ (in arc)	− 15° 51′ 53″	− 0° 49′ 55″

		Immersion.	Emersion.
Washington Mean Time,	Aug. 25,	$7^h 27^m.57$	$8^h 27^m.57$
	$\rho \cos \varphi'$	9.86981	9.86981
	$\sin (h_0 + \tau)$	9.43675 *n*	8.16196 *n*
	$\log \xi$	9.30656 *n*	8.03177 *n*
	ξ	− 0.20256	− 0.010759
	$\rho \sin \varphi'$	9.82561	9.82561
	$\cos d$	9.95556	9.95556
	$\log \rho \sin \varphi' \cos d$	9.78117	9.78117
	(1)	+ 0.60420	+ 0.60420
	$\rho \cos \varphi'$	9.86981	9.86981
	$\sin d$	9.63368 *n*	9.63368 *n*
	$\cos (h_0 + \tau)$	9.98314	9.99995
	$\log \rho \cos \varphi' \sin d \cos (h_0 + \tau)$	9.48663 *n*	9.50344 *n*
	(2)	− 0.30664	− 0.31874
(1)−(2)	η	+ 0.91084	+ 0.92294
	const. log	9.41920	9.41920
	$\log \rho \cos \varphi' \cos (h_0 + \tau)$	9.85295	9.86976
	$\log \xi'$	9.27215	9.28896
	ξ'	+ 0.18713	+ 0.19452
	const. log	9.41920	9.41920
	$\log \xi$	9.30656 *n*	8.03177 *n*
	$\sin d$	9.63368 *n*	9.63368 *n*
	$\log \eta'$	8.35944	7.08465
	η'	+ 0.02288	+ 0.001215
	$\log x'$	9.77945	9.77945
	$\log \tau$	9.82097 *n*	9.52870
	$\log x$	9.60042 *n*	9.30815
	x	− 0.39850	+ 0.20330
	$x - \xi$	− 0.19594	+ 0.21406
	$\log y'$	8.47422 *n*	8.47422 *n*
	$\log \tau$	9.82097 *n*	9.52870
	$\log y' \tau$	8.29519	8.00292 *n*
	$y' \tau$	+ 0.01973	− 0.01007
	Y	+ 0.92120	+ 0.92120
	$Y + y' \tau = y$	+ 0.94093	+ 0.91113
	$y - \eta$	+ 0.03009	− 0.01181
	$x' - \xi'$	+ 0.41467	+ 0.40728
	$y' - \eta'$	− 0.05268	− 0.03101
	$\log m \sin M$	9.29212 *n*	9.33053
	$\log m \cos M$	8.47842	8.07225 *n*
	$\tan M$	0.81370 *n*	1.25828 *n*
	M	278° 43′ 50″	93° 9′ 29″
	$\cos M$	9.18124	8.74108 *n*
	$\log m$	9.29718	9.33117

	Immersion.	Emersion.
Washington Mean Time, Aug. 25,	$7^h 27^m.57$	$8^h 27^m.57$
$\log n \sin N$	9.61770	9.60989
$\log n \cos N$	8.72165 n	8.49157 n
$\tan N$	0.89605 n	1.11832 n
N	97° 14′ 25″	94° 21′ 17″
$\cos N$	9.10048 n	8.88042 n
$\log n$	9.62117	9.61115
colog 60	8.22185	8.22185
$\log n'$	7.84302	7.83300
const. log	0.56500	0.56500
$\log m$	9.29718	9.33117
$\sin (M - N)$	8.41509 n	8.31982 n
$\sin \psi$	8.27727 n	8.21599 n
ψ	− 1° 5′ 6″	− 0° 56′ 31″
$\log \frac{m}{n'}$	1.45416	1.49817
$\cos (M - N)$	9.99985 n	9.99990
$\log \frac{m}{n'} \cos (M - N)$	1.45401 n	1.49807
const. log	9.43500	9.43500
co log n'	2.15698	2.16700
$\cos \psi$	9.99992	9.99994
	1.59190	1.60194
$-\frac{m}{n'} \cos (M - N)$	$+\ 28^m.445$	$-\ 31^m.483$
$\frac{[9.43500]}{n'} \cos \psi$	+ 39.075	+ 39.989
t_1	− 10.630	+ 8.506
	7 27.570	8 27.570
Washington mean time of phase, Aug. 25,	7 16.940	8 36.076
λ	0 26.720	0 26.720
Ann Arbor mean time of phase, Aug. 25,	6 50.220	8 9.356

Prediction of Many Occultations for a Given Place.—When it is desired to predict all the occultations which will be visible at some one place, tables may be constructed and applied in such a way as to greatly diminish the labor of computation. In using such tables, the most convenient course will be to find for each occultation the hour-angle of the star at the moment of apparent conjunction in right ascension, as seen from the place of observation. The table of elements, pages 422—447, gives H, the Washington hour-angle at the moment of geocentric conjunction. The corresponding geocentric hour-angle at the place will be

$$h_0 = H - \lambda \qquad (\lambda = \text{west longitude from Washington}).$$

The moment of apparent conjunction, as seen from the station, will be given by the condition $\xi = x$; or, using the values of ξ and x,

$$\rho \cos \varphi' \sin h = x' \tau$$

h being the west hour-angle of the star at the moment in question, and τ the interval, in hours of mean time, which has elapsed since geocentric conjunction. We shall therefore have,

$$h = h_0 + \tau$$

for the hour-angle at the end of the interval τ after geocentric conjunction. In srictness, τ should here be multiplied by the factor $1 + \frac{1}{365.25}$, because the star moves a little more than 15° in an hour of mean time; but the error arises from the neglect of the factor is too small to be important, as it will affect the predicted time of conjunction by less than 10 seconds. The equation for finding τ is therefore,

$$\rho \cos \varphi' \sin (h_0 + \tau) = x' \tau$$

The quantities h_0 and x' being derived immediately from the data of the Ephemeris, the quantity τ is readily obtained by successive approximation, and may be tabulated as a function of h_0 and x'. The computation of τ is effected as follows. We have

$$\sin (h_0 + \tau) = \sin h_0 + 2 \sin \tfrac{1}{2} \tau \cos (h_0 + \tfrac{1}{2} \tau) \tag{1}$$

The value of τ in arc being seldom more than 24° we may put τ itself for $2 \sin \frac{1}{2} \tau$. The equation will then become

$$\rho \cos \varphi' \sin h_0 + \tau \rho \cos \varphi' \cos (h_0 + \tfrac{1}{2}\tau) = x' \tau$$

from which we find

$$\tau = \frac{\rho \cos \varphi' \sin h_0}{x' - \rho \cos \varphi' \cos (h_0 + \frac{1}{2}\tau)} \tag{2}$$

To tabulate τ, we must first have a table of the quantities

$$\begin{aligned} \xi &= \rho \cos \varphi' \sin h \\ \xi' &= [9.41916] \rho \cos \varphi' \cos h \end{aligned} \tag{3}$$

which table may be formed for every 10 minutes (in time) of h. If we then put ξ_0 for the value of ξ corresponding to $h = h_0$ and ξ'_1 for the value of ξ' corresponding to $h = h_0 + \frac{1}{2} \tau$, we shall have

$$\tau = \frac{\xi_0}{x' - \xi'_1} \tag{4}$$

Since we must know the value of τ, approximately, before we can take ξ'_1 from the table, this equation can be solved only by successive approximations. The approximations converge so rapidly as to offer no difficulty. It will be best to begin by comparing values of τ for the two extremes of x', namely, $x'=0.48$ and $x'=0.60$, because the approximate values of τ can then be interpolated for all the intermediate values of x'. For the first approximation may be taken—

$$\begin{aligned} \tfrac{1}{2}\tau &= 50^{\mathrm{m}} \sin \tfrac{4}{3} h_0 \quad (\text{for } x' = 0.48) \\ \tfrac{1}{2}\tau &= 40^{\mathrm{m}} \sin \tfrac{4}{3} h_0 \quad (\text{for } x' = 0.60) \end{aligned} \tag{5}$$

or, the approximate values of τ may be taken from Mr. DOWNES's table, pages 450—451. It will be best to make the computation for every 30^{m} of h_0, and to find the intermediate values of τ for every 10^{m} by interpolation. Then for each 30^{m} of h_0 we take ξ' from a table with the argument $h_0 + \frac{1}{2} \tau$, and log ξ with the argument h_0, and thence compute τ by (4). If the value of τ thus arrived at differs more than 3^{m} from that employed in taking out ξ', a new value may be used to correct ξ', and the computation may be repeated. The values corresponding to $x' = 0.51$, $x' = 0.54$, and $x' = 0.57$, can then be computed with the single interpolation of approximate values of τ, and afterward the table can be extended by interpolation to every 0.01 of x' between $x' = 0.48$ and $x' = 0.62$. It will be best to compute τ in the first place of every 0.001 of an hour, and to drop the last figure in forming the definitive table. The table thus formed will be called *Table I.*

The values of η and η' may then be tabulated for every degree of the star's declination, and every 10^{m} of h. It is a mere question of convenience whether to compute the table for negative values of d, since by putting

$$\begin{aligned}\eta_1 &= \rho \sin \varphi' \cos d \\ \eta_2 &= -\rho \cos \varphi' \sin d \cos h\end{aligned}$$

η_1 may be given in a table of single-entry; and taking η_2 from the table of double-entry for a positive d, we shall have

$$\eta = \eta_1 \pm \eta_2$$

the lower sign being used for a negative d. But the extension of the table for η to negative values of d is so readily made that it will probably be found better to do it, so as to save taking out η_1 and η_2 separately.

This table for η will be called *Table II*, and the corresponding one for η' with the same arguments *Table III*. The precepts for using the tables will then be as follow:—

From Table I with the arguments x' and $H - \lambda = h_0$ take out the value of τ. It will be sufficient to use the nearest 0.01 of x'. τ will be of the same sign as h_0. Then, enter Table II with the arguments d (the star's declination) and $h = h_0 + \tau$, and take out the value of η. Form the quantities $y = Y + y'\tau$, and $y - \eta$. If the latter quantity lies between the limits ± 0.28, it is almost certain that there will be an occultation. If it falls without the limits ± 0.33, it is almost certain that there will not be an occultation. Between the years 1881 and 1890 these last limits may be reduced to ± 0.32, and cases near this limit may be rejected if y' is small. A convenient rule to adopt will be—

$$\begin{array}{rl} y' < 0.10, & = \pm 0.29 \\ 0.10 < y' < 0.15, & = \pm 0.30 \\ 0.15 < y' < 0.20, & = \pm 0.31 \\ 0.20 < y' & = \pm 0.33 \text{ or } \pm 0.32 \end{array}$$

Here, only the absolute value of y' is to be considered, without respect to its algebraic sign.

If $y - \eta$ falls between the limits thus indicated, take the values of ξ' and η' from the appropriate tables and compute v, Q and Δ from the equations

$$\begin{aligned} v \sin Q &= y' - \eta' \\ v \cos Q &= x' - \xi' \\ \Delta &= (y - \eta) \cos Q \end{aligned}$$

If $\Delta > 0.2723$ or $\log \Delta > 9.4350$ there will be no occultation, though the moon may graze the star when $\Delta - 0.2723$ is very small. If $\Delta < 0.2723$, compute

$$\tau_1 = -\frac{y - \eta}{v} \sin Q \qquad \cos P = \frac{\Delta}{0.2723} \qquad (P < 180°)$$

$$\tau_2 = \frac{0.2723 \sin P}{v}$$

We shall then have—

Local mean time of immersion, $T - \lambda + \tau + \tau_1 - \tau_2$
Local mean time of emersion, $T - \lambda + \tau + \tau_1 + \tau_2$
Position-angle from north toward east at immersion, $180° - Q - P$
Position-angle from north toward east at emersion, $180° - Q + P$

In predicting the occultations for a given place, the first operation will be to go over the list of occultations in the Ephemeris, and select those which may be visible. The conditions of possible visibility are:—

1. The limiting parallels in the last columns must include the latitude of the place.

2. The quantity $H - \lambda$, taken without regard to sign, must be less than the semi-diurnal arc of the star by at least one hour. On very rare occasions an emersion might be seen in the east horizon, or an immersion in the west, when this difference is a few minutes less than an hour.

3. The sun must not be much more than an hour above the horizon at the local mean time $T - \lambda$, unless the star is bright enough to be seen in the day time.

The most convenient course will be to write the value of $- \lambda$ on the bottom of a sheet of paper, and, passing through the list of occultations, pause over each one for which condition (1) is fulfilled, and examine whether conditions (2) and (3) are fulfilled. If either fails, the computer passes on. Very often it will require some examination to find whether $H - \lambda$ or $T - \lambda$ falls within the limits; in these cases, the computer may mark the occultation for trial and leave the decision for the subsequent operations. The whole list can be gone over in less than a day, and it will probably be found that about one-tenth of the occultations are marked for trial.

Phenomena of Planets and Satellites, pages 452—485.—These are, for the most part, sufficiently explained in the body of the work. The following additional explanations are added for completeness.

Disks of Mercury and Venus, pages 452—453.—The angle θ, needed in reducing meridian observations, is the angle which the arc of the great circle from the planet to the sun, makes with the arc from the planet toward the west, reckoned in the direction west, north, east, south. This position-angle is reckoned from 0° to 360°, as in the measurement of double stars, the planet taking the place of the central star. But its measure is 90° greater than that of a double star.

We may also regard θ as expressing the angle which the line of cusps makes with the meridian, the positive direction of the meridian being toward the north, and the positive direction of the line of cusps that in which a person following this line would have the illuminated portion of the disk on his right.

Satellites and Disk of Mars, page 454.—This page gives the Washington mean time of the greatest eastern and western elongations, the position angles and the distances of the satellites from the centre of the planet, for three weeks preceding and following opposition.

Satellites of Jupiter, pages 455—479.—The times of phenomena are explained at the foot of each page; the diagram is on page 455.

Phenomena, pages 486—487.—The conjunctions, quadratures, and oppositions of the planets with respect to the sun, give the hours when the longitude of each planet differs from that of the sun by 0°, 90° or 180°.

The conjunctions of the moon and planets with each other are given in right ascension. The degrees and minutes to the right show the difference of declination at the moment of conjunction.

Latitude by Observed Altitude of Polaris.—Table IV replaces the Tables A, B, C, D, given as a *Supplement* to the volumes of the Ephemeris for 1874—1881, and is intended for use at sea and reconnaissance on land. It will furnish an approximate value of the latitude, the probable error of which, in so far as the table is concerned, will be a few tenths of a minute of arc.

The directions for using the table are adapted to a right ascension of Polaris equal to $1^{h}\ 18^{m}.6$. Somewhat greater accuracy may be insured by substituting the right ascension of Polaris at the date of observation, from pages 302—313 of this volume.

APPENDIX.

ON THE CONSTRUCTION OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC FOR 1890.

The adopted constants of precession, nutation, and aberration are those of **Struve** and **Peters**, namely:—

$$\text{Precession} = 50''.2411 + 0''.0002268\ t$$
$$\text{Nutation} = 9''.2231 + 0''.000009\ t$$
$$\text{Aberration} = 20''.4451$$

in which t is the number of years after 1800.0.

The obliquity of the ecliptic is that of **Hansen**'s *Tables du Soleil*, which is 0″.31 greater than that of **Peters**, given in the issues of this Ephemeris preceding that for 1882. A comparison of **Hansen**'s mean obliquity with that of **Peters** and of **Le Verrier** at different epochs is given in the following table:—

Epoch.	Hansen.			Peters.	Le Verrier.	H.—P.	H.—L.
	°	′	″	″	″	″	″
1750	23	28	18.19	17.44	19.42	+0.75	−1.23
1800	23	27	54.80	54.22	55.63	+0.58	−0.83
1850	23	27	31.42	30.99	31.83	+0.43	−0.41
1900	23	27	8.02	7.76	8.03	+0.26	−0.01

The formulæ for reducing the places of the fixed stars, page 280, correspond to the *Star Tables of the American Ephemeris*, Washington, 1869.

The mean right ascensions of stars have been reduced to **Newcomb**'s fundamental standard in the catalogue attached to the *Washington Observations for* 1870, Appendix II, with the following exceptions: The right ascensions of the 48 circumpolar stars north of 60° north declination are from Dr. **Gould**'s *Standard Places of Fundamental Stars*, second edition, United States Coast Survey Office, 1866. Of the twelve stars south of 50° south declination, the positions of β Hydri, α Trianguli Australis, and σ Octantis, have been corrected from data furnished by Dr. **Gould**; while the remaining nine are, as before, from the *British Nautical Almanac* for 1848.

The right ascensions of the additional stars in the general list, whose apparent right ascensions are given in a subsequent section, have been taken partly from the *Catalogue of* 1098 *Standard Clock and Zodiacal Stars*, forming Part IV of Vol. I of *Astronomical Papers Prepared for the Use of the American Ephemeris and Nautical Almanac*, Washington, 1881; and partly from the catalogue of the Astronomische Gesellschaft of 1878. A few have been derived from recent catalogues without a rigorous reduction for equinox.

The mean declinations of stars are taken from **Boss**'s paper in the *Report of the Northern Boundary Commission*, Washington, 1879, for all stars found therein. The declinations of all the other stars have been reduced to the same standard, except those of the additional ones above, which have been taken partly from the Astronomische Gesellschaft list, and partly from places in recent catalogues. To the apparent places of Sirius and Procyon have been applied the periodic corrections resulting from **Auwers**'s investigations.

The values of these corrections are:—

Year.	Sirius.		Procyon.	
1890.0	$\Delta\alpha = +0^s.110$	$\Delta\delta = -0''.50$	$\Delta\alpha = +0^s.045$	$\Delta\delta = +0''.80$
1891.0	$\Delta\alpha = +0.133$	$\Delta\delta = -0.14$	$\Delta\alpha = +0.053$	$\Delta\delta = +0.69$

The ephemeris of the sun is constructed from HANSEN *and* OLUFSEN's *Tables du Soleil*, Copenhagen, 1853, except that STRUVE's aberration has been used. This is equivalent to adding 0''.19 to the true longitudes, but it does not affect the right ascensions and declinations. The sun's rectangular equatorial co-ordinates have been computed from the longitudes and latitudes by the following formulæ:—

$$\begin{aligned} X &= R \cos \lambda \\ Y &= R \sin \lambda \cos \omega - 19.3\, R\, \beta \\ Z &= R \sin \lambda \sin \omega + 44.5\, R\, \beta \end{aligned}$$

The reductions to mean equinox, 1890.0, are computed by the formulæ,

$$\begin{aligned} \Delta X' &= + Y \sec \omega\, \Delta \lambda \sin 1'' \\ \Delta Y' &= - X \cos \omega\, \Delta \lambda \sin 1'' + Z\, \Delta \omega \sin 1'' - 9.4\, \tau\, R \sin(\lambda + 187^\circ) \\ \Delta Z' &= - X \sin \omega\, \Delta \lambda \sin 1'' - Y\, \Delta \omega \sin 1'' + 21.7\, \tau\, R \sin(\lambda + 187^\circ) \end{aligned}$$

Wherein—

λ and β are the longitude and latitude of the sun referred to the equinox and ecliptic of the date;
ω, the obliquity of the ecliptic;
$\Delta \lambda$, the reduction of longitude for precession and nutation from January 0;
$\Delta \omega$, the reduction of the mean to the apparent obliquity;
τ, the fraction of the year since January 0.

The numerical coefficients are in units of the seventh place of decimals. The correction for latitude has been taken from GOETZE's paper in the *Astronomical Journal*, Vol. II, page 71.

The mean equatorial horizontal parallax of the sun, adopted from Professor NEWCOMB's *Investigation of the Distance of the Sun and the Elements which depend on it*,* is 8''.848. The adopted semidiameter of the sun at the earth's mean distance is 16' 2''. In the computations pertaining to eclipses, BESSEL's semidiameter, 15' 59''.788 has been used.

The right ascension, declination and parallax of the moon are derived from HANSEN's *Tables de la Lune*, London, 1857, the mean longitude being corrected in accordance with NEWCOMB's *Researches on the Motion of the Moon*, Part I, page 268,† and a corrected table being substituted for Table XXXIV.

The semidiameter of the moon is computed from the moon's horizontal parallax by the formula,

$$S = 0.272274\, \pi + 2''.5$$

The constant 2''.5 is omitted in the computation of eclipses and occultations, as due entirely to telescopic and ocular irradiation.

The ephemeris of Mercury is derived from Professor WINLOCK's *Tables of Mercury*, Washington, 1864. They are based on the older theory of LE VERRIER, published in the Additions to the *Connaissance des Temps* for 1848.

The ephemeris of Venus is derived from Mr. G. W. HILL's *Tables of Venus*, Washington, 1872.

The ephemeris of Mars is derived from manuscript tables constructed from LINDENAU's Tables. Mr. HUGH BREEN's results, contained in his paper *On the Corrections of* LINDENAU's *Elements of Mars*, published in the *Memoirs of the Royal Astronomical Society*, Vol. XX, have also been discussed and applied; and LE VERRIER's secular variations of the elements are likewise adopted. The perturbations produced by Jupiter have been increased by $\frac{1}{30}$ of their value. The following are the corresponding corrected elements and annual variations for Washington, 1855.0:—

$$\begin{aligned} L &= 320^\circ\ 13'\ 33''.87 + 689101''.1527\ t \\ \pi &= 333\ 23\ 17.84 + 65.9990\ t \\ \Omega &= 48\ 25\ 55.29 + 27.6997\ t \\ i &= 1\ 51\ 2.20 - 0.02141\ t \\ e &= 19238''.75 + 0.18549\ t \\ n &= 689050''.8927 \\ a &= 1.5236915 \end{aligned}$$

The ephemeris of Jupiter is derived from manuscript tables constructed from BOUVARD's Tables, with such changes as were required to make them correspond more nearly to the formulæ.

The ephemeris of Saturn is derived from a provisional theory constructed by Mr. GEORGE W HILL, and still unpublished.

The ephemerides of Uranus and Neptune are derived from Professor NEWCOMB's Tables, published by the *Smithsonian Institution*.

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* *Astronomical Observations made at the U. S. Naval Observatory, Washington*, 1865, Appendix II.

† *Astronomical Observations made at the U. S. Naval Observatory, Washington*, 1875, Appendix II.

The semidiameters of the planets are computed from the following values:—

	Semidiameter.	Log Dist.	Authority.
Mercury	3″.34 ″	0.00	Le Verrier, *Theory of Mercury.*
Venus	8.546 ± 0.086	0.00	Peirce, from the Washington Observations of 1845 and 1846, made with the Mural Circle.
Mars	2.842 ± 0.057	0.25	
Jupiter (polar)	18.78 ± 0.067	0.70	
Saturn (polar)	8.77 ± 0.039	0.95	
Uranus	1.68 ± 0.3	1.30	
Neptune	1.28	1.48	
Jupiter (equatorial)	20.00	0.70	
Saturn (equatorial)	9.38	0.95	

The elements of eclipses of the sun and occultations of stars by the moon are adapted to Bessel's method, using the special forms in Chauvenet's *Spherical and Practical Astronomy.* The adopted semidiameters are:—

Semidiameter of the sun at distance unity. . . . 959″.788
Ratio of radius of moon to radius of earth . . . 0.27227

The eclipses of Jupiter's satellites are computed from Todd's *Continuation of* Damoiseau's *Tables*, Washington, 1876. The occultations, transits, etc., are computed from Woolhouse's Tables, *British Nautical Almanac* for 1835, Table II of each satellite having been adapted to Damoiseau's Tables.

The elongations and conjunctions of the satellites of Saturn are computed from manuscript tables prepared by Professor Newcomb.

The apparent elements of the rings of Saturn are computed from Bessel's data, except those for the dusky ring.

The elongations of the satellites of Uranus, and of the satellite of Neptune are computed from the data of Professor Newcomb's *Uranian and Neptunian Systems*, Washington, 1875.

In compiling the positions of observatories, the latest available data have been used. The positions have been furnished, in many instances, through the courtesy of the directors of the Observatories, in response to a circular issued by the Superintendent of the American Ephemeris.

The reduction to geocentric latitude, and the logarithm of the radius of the earth, are derived from Bessel's elements of the terrestrial spheroid, as adopted in Table III of Chauvenet's *Spherical and Practical Astronomy*, Vol. II:—

$$\log e = 8.9122052$$
$$\varphi' - \varphi = -11' 30''.65 \sin 2\varphi + 1''.16 \sin 4\varphi$$
$$\log \rho = 9.9992747 + 0.0007271 \cos 2\varphi - 0.0000018 \cos 4\varphi$$

Table IV, for finding the latitude from an observed altitude of Polaris, is constructed for—

(1) An altitude of Polaris equal to 45°.
(2) A declination of Polaris equal to + 88° 43′.

The principal computations of the Ephemeris have been distributed in the following manner:—

The ephemeris of the sun was computed by the late Mr. Eastwood; the moon's longitude, latitude, semidiameter and horizontal parallax, by Professor Keith; right ascension and declination, by Professor Van Vleck; culminations, by Dr. J. Morrison and Mr. Loomis; lunar distances, by the late Mr. J. Meier; Mercury and Venus, by Mr. E. P. Austin; Mars, Jupiter, Saturn, Uranus, and Neptune, by Mr. Roberdeau Buchanan; Jupiter's satellites, by Professor H. D. Todd. The mean and apparent places of the fixed stars were prepared by Mr. H. Meier; the general constants for their reduction, by Mr. Buchanan; the occultations, by Mr. J. O. Wiessner; and the eclipses were computed and the charts projected by Mr. Buchanan.

TABLE I.

CORRECTION REQUIRED, ON ACCOUNT OF SECOND DIFFERENCES OF THE MOON'S MOTION, IN FINDING THE GREENWICH TIME CORRESPONDING TO A CORRECTED LUNAR DISTANCE.

DIFFERENCE OF THE PROPORTIONAL LOGARITHMS IN THE EPHEMERIS.

Approximate Interval.		2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	0	0	0	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3
0 20	2 40	0	1	1	1	1	2	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6
0 30	2 30	0	1	1	2	2	2	2	3	3	3	4	4	5	5	5	6	6	6	7	7	7	8	8	8	9	9
0 40	2 20	0	1	1	2	2	3	3	3	4	4	5	5	6	6	6	7	7	8	8	9	9	10	10	10	11	11
0 50	2 10	1	1	2	2	3	3	4	4	5	5	5	6	6	7	7	8	8	9	9	10	10	11	12	12	13	13
1 0	2 0	1	1	2	2	3	3	4	4	5	6	6	7	7	8	8	9	9	10	10	11	12	12	13	13	14	14
1 10	1 50	1	1	2	2	3	4	4	5	5	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	15
1 20	1 40	1	1	2	3	3	4	4	5	6	6	7	7	8	9	9	10	10	11	12	12	13	14	14	15	15	16
1 30	1 30	1	1	2	3	3	4	4	5	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	16

DIFFERENCE OF THE PROPORTIONAL LOGARITHMS IN THE EPHEMERIS.

		54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	4	4	4	4	4	4	4	4	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	7
0 20	2 40	7	7	7	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	12	12	12
0 30	2 30	9	10	10	10	11	11	12	12	12	13	13	13	14	14	14	14	15	15	16	16	16	17	17	17
0 40	2 20	12	12	13	13	13	14	14	15	15	16	16	16	17	17	18	18	19	19	19	20	20	21	21	22
0 50	2 10	14	14	15	15	16	16	16	17	17	18	19	19	20	20	21	21	22	22	22	23	23	24	24	25
1 0	2 0	15	16	16	17	17	18	18	19	19	20	21	21	22	22	23	23	24	24	25	25	26	27	27	28
1 10	1 50	16	17	17	18	18	19	19	20	21	21	22	22	23	24	24	25	25	26	27	27	28	28	29	30
1 20	1 40	17	17	18	19	19	20	20	21	21	22	23	23	24	25	25	26	26	27	28	28	29	29	30	31
1 30	1 30	17	18	18	19	19	20	21	21	22	23	23	24	24	25	25	26	27	27	28	29	29	30	31	31

DIFFERENCE OF THE PROPORTIONAL LOGARITHMS IN THE EPHEMERIS.

		102	104	106	108	110	112	114	116	118	120	122	124	126	128	130	132	134	136	138
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	7	7	7	7	7	7	7	8	8	8	8	8	8	8	8	9	9	9	9
0 20	2 40	13	13	13	13	14	14	14	14	15	15	15	15	15	16	16	16	16	17	17
0 30	2 30	18	18	18	19	19	19	20	20	20	21	21	21	22	22	22	23	23	24	24
0 40	2 20	22	22	23	23	24	24	25	25	25	26	26	27	27	28	28	28	29	29	30
0 50	2 10	26	26	26	27	27	28	29	29	29	30	30	31	31	32	32	33	33	34	34
1 0	2 0	28	29	29	30	30	31	31	32	33	33	34	34	35	35	36	37	37	38	38
1 10	1 50	30	31	31	32	32	33	34	34	35	35	36	37	37	38	38	39	40	40	41
1 20	1 40	31	32	33	33	34	34	35	35	36	37	38	38	39	39	40	41	41	42	42
1 30	1 30	32	32	33	34	34	35	35	36	36	37	38	39	39	40	40	41	42	42	43

The correction is to be added to the approximate Greenwich time when the proportional logarithms in the Ephemeris are decreasing, and subtracted when they are increasing.

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TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	$0^{\mathrm{h.}}$	$1^{\mathrm{h.}}$	$2^{\mathrm{h.}}$	$3^{\mathrm{h.}}$	$4^{\mathrm{h.}}$	$5^{\mathrm{h.}}$	$6^{\mathrm{h.}}$	$7^{\mathrm{h.}}$	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	0 0.000	0 9.830	0 19.659	0 29.489	0 39.318	0 49.148	0 58.977	1 8.807	0	0.000
1	0 0.164	0 9.993	0 19.823	0 29.653	0 39.482	0 49.312	0 59.141	1 8.971	1	0.003
2	0 0.328	0 10.157	0 19.987	0 29.816	0 39.646	0 49.475	0 59.305	1 9.135	2	0.005
3	0 0.491	0 10.321	0 20.151	0 29.980	0 39.810	0 49.639	0 59.469	1 9.298	3	0.008
4	0 0.655	0 10.485	0 20.314	0 30.144	0 39.974	0 49.803	0 59.633	1 9.462	4	0.011
5	0 0.819	0 10.649	0 20.478	0 30.308	0 40.137	0 49.967	0 59.796	1 9.626	5	0.014
6	0 0.983	0 10.813	0 20.642	0 30.472	0 40.301	0 50.131	0 59.960	1 9.790	6	0.016
7	0 1.147	0 10.976	0 20.806	0 30.635	0 40.465	0 50.295	1 0.124	1 9.954	7	0.019
8	0 1.311	0 11.140	0 20.970	0 30.799	0 40.629	0 50.458	1 0.288	1 10.118	8	0.022
9	0 1.474	0 11.304	0 21.134	0 30.963	0 40.793	0 50.622	1 0.452	1 10.281	9	0.025
10	0 1.638	0 11.468	0 21.297	0 31.127	0 40.956	0 50.786	1 0.616	1 10.445	10	0.027
11	0 1.802	0 11.632	0 21.461	0 31.291	0 41.120	0 50.950	1 0.779	1 10.609	11	0.030
12	0 1.966	0 11.795	0 21.625	0 31.455	0 41.284	0 51.114	1 0.943	1 10.773	12	0.033
13	0 2.130	0 11.959	0 21.789	0 31.618	0 41.448	0 51.278	1 1.107	1 10.937	13	0.035
14	0 2.294	0 12.123	0 21.953	0 31.782	0 41.612	0 51.441	1 1.271	1 11.100	14	0.038
15	0 2.457	0 12.287	0 22.117	0 31.946	0 41.776	0 51.605	1 1.435	1 11.264	15	0.041
16	0 2.621	0 12.451	0 22.280	0 32.110	0 41.939	0 51.769	1 1.599	1 11.428	16	0.044
17	0 2.785	0 12.615	0 22.444	0 32.274	0 42.103	0 51.933	1 1.762	1 11.592	17	0.046
18	0 2.949	0 12.778	0 22.608	0 32.438	0 42.267	0 52.097	1 1.926	1 11.756	18	0.049
19	0 3.113	0 12.942	0 22.772	0 32.601	0 42.431	0 52.260	1 2.090	1 11.920	19	0.052
20	0 3.277	0 13.106	0 22.936	0 32.765	0 42.595	0 52.424	1 2.254	1 12.083	20	0.055
21	0 3.440	0 13.270	0 23.099	0 32.929	0 42.759	0 52.588	1 2.418	1 12.247	21	0.057
22	0 3.604	0 13.434	0 23.263	0 33.093	0 42.922	0 52.752	1 2.582	1 12.411	22	0.060
23	0 3.768	0 13.598	0 23.427	0 33.257	0 43.086	0 52.916	1 2.745	1 12.575	23	0.063
24	0 3.932	0 13.761	0 23.591	0 33.420	0 43.250	0 53.080	1 2.909	1 12.739	24	0.066
25	0 4.096	0 13.925	0 23.755	0 33.584	0 43.414	0 53.243	1 3.073	1 12.903	25	0.068
26	0 4.259	0 14.089	0 23.919	0 33.748	0 43.578	0 53.407	1 3.237	1 13.066	26	0.071
27	0 4.423	0 14.253	0 24.082	0 33.912	0 43.742	0 53.571	1 3.401	1 13.230	27	0.074
28	0 4.587	0 14.417	0 24.246	0 34.076	0 43.905	0 53.735	1 3.564	1 13.394	28	0.076
29	0 4.751	0 14.581	0 24.410	0 34.240	0 44.069	0 53.899	1 3.728	1 13.558	29	0.079
30	0 4.915	0 14.744	0 24.574	0 34.403	0 44.233	0 54.063	1 3.892	1 13.722	30	0.082
31	0 5.079	0 14.908	0 24.738	0 34.567	0 44.397	0 54.226	1 4.056	1 13.886	31	0.085
32	0 5.242	0 15.072	0 24.902	0 34.731	0 44.561	0 54.390	1 4.220	1 14.049	32	0.087
33	0 5.406	0 15.236	0 25.065	0 34.895	0 44.724	0 54.554	1 4.384	1 14.213	33	0.090
34	0 5.570	0 15.400	0 25.229	0 35.059	0 44.888	0 54 718	1 4.547	1 14.377	34	0.093
35	0 5.734	0 15.563	0 25.393	0 35.223	0 45.052	0 54.882	1 4.711	1 14.541	35	0.096
36	0 5.898	0 15.727	0 25.557	0 35.386	0 45.216	0 55.046	1 4.875	1 14.705	36	0.098
37	0 6.062	0 15.891	0 25.721	0 35.550	0 45.380	0 55.209	1 5.039	1 14.868	37	0.101
38	0 6.225	0 16.055	0 25.885	0 35.714	0 45.544	0 55.373	1 5.203	1 15.032	38	0.104
39	0 6.389	0 16.219	0 26.048	0 35.878	0 45.707	0 55.537	1 5.367	1 15.196	39	0.106
40	0 6.553	0 16.383	0 26.212	0 36.042	0 45.871	0 55.701	1 5.530	1 15.360	40	0.109
41	0 6.717	0 16.546	0 26.376	0 36.206	0 46.035	0 55.865	1 5.694	1 15.524	41	0.112
42	0 6.881	0 16.710	0 26.540	0 36.369	0 46.199	0 56.028	1 5.858	1 15.688	42	0.115
43	0 7.045	0 16.874	0 26.704	0 36.533	0 46.363	0 56.192	1 6.022	1 15.851	43	0.117
44	0 7.208	0 17.038	0 26.867	0 36.697	0 46.527	0 56.356	1 6.186	1 16.015	44	0.120
45	0 7.372	0 17.202	0 27.031	0 36.861	0 46.690	0 56.520	1 6.350	1 16.179	45	0.123
46	0 7.536	0 17.366	0 27.195	0 37.025	0 46.854	0 56.684	1 6.513	1 16.343	46	0.126
47	0 7.700	0 17.529	0 27.359	0 37.188	0 47.018	0 56.848	1 6.677	1 16.507	47	0.128
48	0 7.864	0 17.693	0 27.523	0 37.352	0 47.182	0 57.011	1 6.841	1 16.671	48	0.131
49	0 8.027	0 17.857	0 27.687	0 37.516	0 47.346	0 57.175	1 7.005	1 16.834	49	0.134
50	0 8.191	0 18.021	0 27.850	0 37.680	0 47.510	0 57.339	1 7.169	1 16.998	50	0.137
51	0 8.355	0 18.185	0 28.014	0 37.844	0 47.673	0 57.503	1 7.332	1 17.162	51	0.139
52	0 8.519	0 18.349	0 28.178	0 38.008	0 47.837	0 57.667	1 7.496	1 17.326	52	0.142
53	0 8.683	0 18.512	0 28.342	0 38.171	0 48.001	0 57.831	1 7.660	1 17.490	53	0.145
54	0 8.847	0 18.676	0 28.506	0 38.335	0 48.165	0 57.994	1 7.824	1 17.654	54	0.147
55	0 9.010	0 18.840	0 28.670	0 38.499	0 48.329	0 58.158	1 7.988	1 17.817	55	0.150
56	0 9.174	0 19.004	0 28.833	0 38.663	0 48.492	0 58.322	1 8.152	1 17.981	56	0.153
57	0 9.338	0 19.168	0 28.997	0 38.827	0 48.656	0 58.486	1 8.315	1 18.145	57	0.156
58	0 9.502	0 19.331	0 29.161	0 38.991	0 48.820	0 58.650	1 8.479	1 18.309	58	0.158
59	0 9.666	0 19.495	0 29.325	0 39.154	0 48.984	0 58.814	1 8.643	1 18.473	59	0.161
Sidereal.	$0^{\mathrm{h.}}$	$1^{\mathrm{h.}}$	$2^{\mathrm{h.}}$	$3^{\mathrm{h.}}$	$4^{\mathrm{h.}}$	$5^{\mathrm{h.}}$	$6^{\mathrm{h.}}$	$7^{\mathrm{h.}}$	For Seconds.	

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	$8^{h.}$	$9^{h.}$	$10^{h.}$	$11^{h.}$	$12^{h.}$	$13^{h.}$	$14^{h.}$	$15^{h.}$	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	1 18.636	1 28.466	1 38.296	1 48.125	1 57.955	2 7.784	2 17.614	2 27.443	0	0.000
1	1 18.800	1 28.630	1 38.459	1 48.289	1 58.119	2 7.948	2 17.778	2 27.607	1	0.003
2	1 18.964	1 28.794	1 38.623	1 48.453	1 58.282	2 8.112	2 17.941	2 27.771	2	0.005
3	1 19.128	1 28.958	1 38.787	1 48.617	1 58.446	2 8.276	2 18.105	2 27.935	3	0.008
4	1 19.292	1 29.121	1 38.951	1 48.780	1 58.610	2 8.440	2 18.269	2 28.099	4	0.011
5	1 19.456	1 29.285	1 39.115	1 48.944	1 58.774	2 8.603	2 18.433	2 28.263	5	0.014
6	1 19.619	1 29.449	1 39.279	1 49.108	1 58.938	2 8.767	2 18.597	2 28.426	6	0.016
7	1 19.783	1 29.613	1 39.442	1 49.272	1 59.101	2 8.931	2 18.761	2 28.590	7	0.019
8	1 19.947	1 29.777	1 39.606	1 49.436	1 59.265	2 9.095	2 18.924	2 28.754	8	0.022
9	1 20.111	1 29.940	1 39.770	1 49.600	1 59.429	2 9.259	2 19.088	2 28.918	9	0.025
10	1 20.275	1 30.104	1 39.934	1 49.763	1 59.593	2 9.423	2 19.252	2 29.082	10	0.027
11	1 20.439	1 30.268	1 40.098	1 49.927	1 59.757	2 9.586	2 19.416	2 29.245	11	0.030
12	1 20.602	1 30.432	1 40.261	1 50.091	1 59.921	2 9.750	2 19.580	2 29.409	12	0.033
13	1 20.766	1 30.596	1 40.425	1 50.255	2 0.084	2 9.914	2 19.744	2 29.573	13	0.035
14	1 20.930	1 30.760	1 40.589	1 50.419	2 0.248	2 10.078	2 19.907	2 29.737	14	0.038
15	1 21.094	1 30.923	1 40.753	1 50.583	2 0.412	2 10.242	2 20.071	2 29.901	15	0.041
16	1 21.258	1 31.087	1 40.917	1 50.746	2 0.576	2 10.405	2 20.235	2 30.065	16	0.044
17	1 21.422	1 31.251	1 41.081	1 50.910	2 0.740	2 10.569	2 20.399	2 30.228	17	0.046
18	1 21.585	1 31.415	1 41.244	1 51.074	2 0.904	2 10.733	2 20.563	2 30.392	18	0.049
19	1 21.749	1 31.579	1 41.408	1 51.238	2 1.067	2 10.897	2 20.727	2 30.556	19	0.052
20	1 21.913	1 31.743	1 41.572	1 51.402	2 1.231	2 11.061	2 20.890	2 30.720	20	0.055
21	1 22.077	1 31.906	1 41.736	1 51.565	2 1.395	2 11.225	2 21.054	2 30.884	21	0.057
22	1 22.241	1 32.070	1 41.900	1 51.729	2 1.559	2 11.388	2 21.218	2 31.048	22	0.060
23	1 22.404	1 32.234	1 42.064	1 51.893	2 1.723	2 11.552	2 21.382	2 31.211	23	0.063
24	1 22.568	1 32.398	1 42.227	1 52.057	2 1.887	2 11.716	2 21.546	2 31.375	24	0.066
25	1 22.732	1 32.562	1 42.391	1 52.221	2 2.050	2 11.880	2 21.709	2 31.539	25	0.068
26	1 22.896	1 32.726	1 42.555	1 52.385	2 2.214	2 12.044	2 21.873	2 31.703	26	0.071
27	1 23.060	1 32.889	1 42.719	1 52.548	2 2.378	2 12.208	2 22.037	2 31.867	27	0.074
28	1 23.224	1 33.053	1 42.883	1 52.712	2 2.542	2 12.371	2 22.201	2 32.031	28	0.076
29	1 23.387	1 33.217	1 43.047	1 52.876	2 2.706	2 12.535	2 22.365	2 32.194	29	0.079
30	1 23.551	1 33.381	1 43.210	1 53.040	2 2.869	2 12.699	2 22.529	2 32.358	30	0.082
31	1 23.715	1 33.545	1 43.374	1 53.204	2 3.033	2 12.863	2 22.692	2 32.522	31	0.085
32	1 23.879	1 33.708	1 43.538	1 53.368	2 3.197	2 13.027	2 22.856	2 32.686	32	0.087
33	1 24.043	1 33.872	1 43.702	1 53.531	2 3.361	2 13.191	2 23.020	2 32.850	33	0.090
34	1 24.207	1 34.036	1 43.866	1 53.695	2 3.525	2 13.354	2 23.184	2 33.013	34	0.093
35	1 24.370	1 34.200	1 44.029	1 53.859	2 3.689	2 13.518	2 23.348	2 33.177	35	0.096
36	1 24.534	1 34.364	1 44.193	1 54.023	2 3.852	2 13.682	2 23.512	2 33.341	36	0.098
37	1 24.698	1 34.528	1 44.357	1 54.187	2 4.016	2 13.846	2 23.675	2 33.505	37	0.101
38	1 24.862	1 34.691	1 44.521	1 54.351	2 4.180	2 14.010	2 23.839	2 33.669	38	0.104
39	1 25.026	1 34.855	1 44.685	1 54.514	2 4.344	2 14.173	2 24.003	2 33.833	39	0.106
40	1 25.190	1 35.019	1 44.849	1 54.678	2 4.508	2 14.337	2 24.167	2 33.996	40	0.109
41	1 25.353	1 35.183	1 45.012	1 54.842	2 4.672	2 14.501	2 24.331	2 34.160	41	0.112
42	1 25.517	1 35.347	1 45.176	1 55.006	2 4.835	2 14.665	2 24.495	2 34.324	42	0.115
43	1 25.681	1 35.511	1 45.340	1 55.170	2 4.999	2 14.829	2 24.658	2 34.488	43	0.117
44	1 25.845	1 35.674	1 45.504	1 55.333	2 5.163	2 14.993	2 24.822	2 34.652	44	0.120
45	1 26.009	1 35.838	1 45.668	1 55.497	2 5.327	2 15.156	2 24.986	2 34.816	45	0.123
46	1 26.172	1 36.002	1 45.832	1 55.661	2 5.491	2 15.320	2 25.150	2 34.979	46	0.126
47	1 26.336	1 36.166	1 45.995	1 55.825	2 5.655	2 15.484	2 25.314	2 35.143	47	0.128
48	1 26.500	1 36.330	1 46.159	1 55.989	2 5.818	2 15.648	2 25.477	2 35.307	48	0.131
49	1 26.664	1 36.493	1 46.323	1 56.153	2 5.982	2 15.812	2 25.641	2 35.471	49	0.134
50	1 26.828	1 36.657	1 46.487	1 56.316	2 6.146	2 15.976	2 25.805	2 35.635	50	0.137
51	1 26.992	1 36.821	1 46.651	1 56.480	2 6.310	2 16.139	2 25.969	2 35.798	51	0.139
52	1 27.155	1 36.985	1 46.815	1 56.644	2 6.474	2 16.303	2 26.133	2 35.962	52	0.142
53	1 27.319	1 37.149	1 46.978	1 56.808	2 6.637	2 16.467	2 26.297	2 36.126	53	0.145
54	1 27.483	1 37.313	1 47.142	1 56.972	2 6.801	2 16.631	2 26.460	2 36.290	54	0.147
55	1 27.647	1 37.476	1 47.306	1 57.136	2 6.965	2 16.795	2 26.624	2 36.454	55	0.150
56	1 27.811	1 37.640	1 47.470	1 57.299	2 7.129	2 16.959	2 26.788	2 36.618	56	0.153
57	1 27.975	1 37.804	1 47.634	1 57.463	2 7.293	2 17.122	2 26.952	2 36.781	57	0.156
58	1 28.138	1 37.968	1 47.797	1 57.627	2 7.457	2 17.286	2 27.116	2 36.945	58	0.158
59	1 28.302	1 38.132	1 47.961	1 57.791	2 7.620	2 17.450	2 27.280	2 37.109	59	0.161
Sidereal.	$8^{h.}$	$9^{h.}$	$10^{h.}$	$11^{h.}$	$12^{h.}$	$13^{h.}$	$14^{h.}$	$15^{h.}$	For Seconds.	

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	16h.	17h.	18h.	19h.	20h.	21h.	22h.	23h.	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	2 37.273	2 47.102	2 56.932	3 6.762	3 16.591	3 26.421	3 36.250	3 46.080	0	0.000
1	2 37.437	2 47.266	2 57.096	3 6.925	3 16.755	3 26.585	3 36.414	3 46.244	1	0.003
2	2 37.601	2 47.430	2 57.260	3 7.089	3 16.919	3 26.748	3 36.578	3 46.407	2	0.005
3	2 37.764	2 47.594	2 57.424	3 7.253	3 17.083	3 26.912	3 36.742	3 46.571	3	0.008
4	2 37.928	2 47.758	2 57.587	3 7.417	3 17.246	3 27.076	3 36.906	3 46.735	4	0.011
5	2 38.092	2 47.922	2 57.751	3 7.581	3 17.410	3 27.240	3 37.069	3 46.899	5	0.014
6	2 38.256	2 48.085	2 57.915	3 7.745	3 17.574	3 27.404	3 37.233	3 47.063	6	0.016
7	2 38.420	2 48.249	2 58.079	3 7.908	3 17.738	3 27.568	3 37.397	3 47.227	7	0.019
8	2 38.584	2 48.413	2 58.243	3 8.072	3 17.902	3 27.731	3 37.561	3 47.390	8	0.022
9	2 38.747	2 48.577	2 58.406	3 8.236	3 18.066	3 27.895	3 37.725	3 47.554	9	0.025
10	2 38.911	2 48.741	2 58.570	3 8.400	3 18.229	3 28.059	3 37.889	3 47.718	10	0.027
11	2 39.075	2 48.905	2 58.734	3 8.564	3 18.393	3 28.223	3 38.052	3 47.882	11	0.030
12	2 39.239	2 49.068	2 58.898	3 8.728	3 18.557	3 28.387	3 38.216	3 48.046	12	0.033
13	2 39.403	2 49.232	2 59.062	3 8.891	3 18.721	3 28.550	3 38.380	3 48.210	13	0.035
14	2 39.566	2 49.396	2 59.226	3 9.055	3 18.885	3 28.714	3 38.544	3 48.373	14	0.038
15	2 39.730	2 49.560	2 59.389	3 9.219	3 19.049	3 28.878	3 38.708	3 48.537	15	0.041
16	2 39.894	2 49.724	2 59.553	3 9.383	3 19.212	3 29.042	3 38.871	3 48.701	16	0.044
17	2 40.058	2 49.888	2 59.717	3 9.547	3 19.376	3 29.206	3 39.035	3 48.865	17	0.046
18	2 40.222	2 50.051	2 59.881	3 9.710	3 19.540	3 29.370	3 39.199	3 49.029	18	0.049
19	2 40.386	2 50.215	3 0.045	3 9.874	3 19.704	3 29.533	3 39.363	3 49.193	19	0.052
20	2 40.549	2 50.379	3 0.209	3 10.038	3 19.868	3 29.697	3 39.527	3 49.356	20	0.055
21	2 40.713	2 50.543	3 0.372	3 10.202	3 20.032	3 29.861	3 39.691	3 49.520	21	0.057
22	2 40.877	2 50.707	3 0.536	3 10.366	3 20.195	3 30.025	3 39.854	3 49.684	22	0.060
23	2 41.041	2 50.870	3 0.700	3 10.530	3 20.359	3 30.189	3 40.018	3 49.848	23	0.063
24	2 41.205	2 51.034	3 0.864	3 10.693	3 20.523	3 30.353	3 40.182	3 50.012	24	0.066
25	2 41.369	2 51.198	3 1.028	3 10.857	3 20.687	3 30.516	3 40.346	3 50.175	25	0.068
26	2 41.532	2 51.362	3 1.192	3 11.021	3 20.851	3 30.680	3 40.510	3 50.339	26	0.071
27	2 41.696	2 51.526	3 1.355	3 11.185	3 21.014	3 30.844	3 40.674	3 50.503	27	0.074
28	2 41.860	2 51.690	3 1.519	3 11.349	3 21.178	3 31.008	3 40.837	3 50.667	28	0.076
29	2 42.024	2 51.853	3 1.683	3 11.513	3 21.342	3 31.172	3 41.001	3 50.831	29	0.079
30	2 42.188	2 52.017	3 1.847	3 11.676	3 21.506	3 31.336	3 41.165	3 50.995	30	0.082
31	2 42.352	2 52.181	3 2.011	3 11.840	3 21.670	3 31.499	3 41.329	3 51.158	31	0.085
32	2 42.515	2 52.345	3 2.174	3 12.004	3 21.834	3 31.663	3 41.493	3 51.322	32	0.087
33	2 42.679	2 52.509	3 2.338	3 12.168	3 21.997	3 31.827	3 41.657	3 51.486	33	0.090
34	2 42.843	2 52.673	3 2.502	3 12.332	3 22.161	3 31.991	3 41.820	3 51.650	34	0.093
35	2 43.007	2 52.836	3 2.666	3 12.496	3 22.325	3 32.155	3 41.984	3 51.814	35	0.096
36	2 43.171	2 53.000	3 2.830	3 12.659	3 22.489	3 32.318	3 42.148	3 51.978	36	0.098
37	2 43.334	2 53.164	3 2.994	3 12.823	3 22.653	3 32.482	3 42.312	3 52.141	37	0.101
38	2 43.498	2 53.328	3 3.157	3 12.987	3 22.817	3 32.646	3 42.476	3 52.305	38	0.104
39	2 43.662	2 53.492	3 3.321	3 13.151	3 22.980	3 32.810	3 42.639	3 52.469	39	0.106
40	2 43.826	2 53.656	3 3.485	3 13.315	3 23.144	3 32.974	3 42.803	3 52.633	40	0.109
41	2 43.990	2 53.819	3 3.649	3 13.478	3 23.308	3 33.138	3 42.967	3 52.797	41	0.112
42	2 44.154	2 53.983	3 3.813	3 13.642	3 23.472	3 33.301	3 43.131	3 52.961	42	0.115
43	2 44.317	2 54.147	3 3.977	3 13.806	3 23.636	3 33.465	3 43.295	3 53.124	43	0.117
44	2 44.481	2 54.311	3 4.140	3 13.970	3 23.800	3 33.629	3 43.459	3 53.288	44	0.120
45	2 44.645	2 54.475	3 4.304	3 14.134	3 23.963	3 33.793	3 43.622	3 53.452	45	0.123
46	2 44.809	2 54.638	3 4.468	3 14.298	3 24.127	3 33.957	3 43.786	3 53.616	46	0.126
47	2 44.973	2 54.802	3 4.632	3 14.461	3 24.291	3 34.121	3 43.950	3 53.780	47	0.128
48	2 45.137	2 54.966	3 4.796	3 14.625	3 24.455	3 34.284	3 44.114	3 53.943	48	0.131
49	2 45.300	2 55.130	3 4.960	3 14.789	3 24.619	3 34.448	3 44.278	3 54.107	49	0.134
50	2 45.464	2 55.294	3 5.123	3 14.953	3 24.782	3 34.612	3 44.442	3 54.271	50	0.137
51	2 45.628	2 55.458	3 5.287	3 15.117	3 24.946	3 34.776	3 44.605	3 54.435	51	0.139
52	2 45.792	2 55.621	3 5.451	3 15.281	3 25.110	3 34.940	3 44.769	3 54.599	52	0.142
53	2 45.956	2 55.785	3 5.615	3 15.444	3 25.274	3 35.104	3 44.933	3 54.763	53	0.145
54	2 46.120	2 55.949	3 5.779	3 15.608	3 25.438	3 35.267	3 45.097	3 54.926	54	0.147
55	2 46.283	2 56.113	3 5.942	3 15.772	3 25.602	3 35.431	3 45.261	3 55.090	55	0.150
56	2 46.447	2 56.277	3 6.106	3 15.936	3 25.765	3 35.595	3 45.425	3 55.254	56	0.153
57	2 46.611	2 56.441	3 6.270	3 16.100	3 25.929	3 35.759	3 45.588	3 55.418	57	0.156
58	2 46.775	2 56.604	3 6.434	3 16.264	3 26.093	3 35.923	3 45.752	3 55.582	58	0.158
59	2 46.939	2 56.768	3 6.598	3 16.427	3 26.257	3 36.086	3 45.916	3 55.746	59	0.161
Sidereal.	16h.	17h.	18h.	19h.	20h.	21h.	22h.	23h.	For Seconds.	

TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	$0^{\text{h.}}$	$1^{\text{h.}}$	$2^{\text{h.}}$	$3^{\text{h.}}$	$4^{\text{h.}}$	$5^{\text{h.}}$	$6^{\text{h.}}$	$7^{\text{h.}}$	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	0 0.000	0 9.856	0 19.713	0 29.569	0 39.426	0 49.282	0 59.139	1 8.995	0	0.000
1	0 0.164	0 10.021	0 19.877	0 29.734	0 39.590	0 49.447	0 59.303	1 9.160	1	0.003
2	0 0.329	0 10.185	0 20.041	0 29.898	0 39.754	0 49.611	0 59.467	1 9.324	2	0.005
3	0 0.493	0 10.349	0 20.206	0 30.062	0 39.919	0 49.775	0 59.632	1 9.488	3	0.008
4	0 0.657	0 10.514	0 20.370	0 30.227	0 40.083	0 49.939	0 59.796	1 9.652	4	0.011
5	0 0.821	0 10.678	0 20.534	0 30.391	0 40.247	0 50.104	0 59.960	1 9.817	5	0.014
6	0 0.986	0 10.842	0 20.699	0 30.555	0 40.412	0 50.268	1 0.124	1 9.981	6	0.016
7	0 1.150	0 11.006	0 20.863	0 30.719	0 40.576	0 50.432	1 0.289	1 10.145	7	0.019
8	0 1.314	0 11.171	0 21.027	0 30.884	0 40.740	0 50.597	1 0.453	1 10.310	8	0.022
9	0 1.478	0 11.335	0 21.191	0 31.048	0 40.904	0 50.761	1 0.617	1 10.474	9	0.025
10	0 1.643	0 11.499	0 21.356	0 31.212	0 41.069	0 50.925	1 0.782	1 10.638	10	0.027
11	0 1.807	0 11.663	0 21.520	0 31.376	0 41.233	0 51.089	1 0.946	1 10.802	11	0.030
12	0 1.971	0 11.828	0 21.684	0 31.541	0 41.397	0 51.254	1 1.110	1 10.967	12	0.033
13	0 2.136	0 11.992	0 21.849	0 31.705	0 41.561	0 51.418	1 1.274	1 11.131	13	0.036
14	0 2.300	0 12.156	0 22.013	0 31.869	0 41.726	0 51.582	1 1.439	1 11.296	14	0.038
15	0 2.464	0 12.321	0 22.177	0 32.034	0 41.890	0 51.746	1 1.603	1 11.459	15	0.041
16	0 2.628	0 12.485	0 22.341	0 32.198	0 42.054	0 51.911	1 1.767	1 11.624	16	0.044
17	0 2.793	0 12.649	0 22.506	0 32.362	0 42.219	0 52.075	1 1.932	1 11.788	17	0.047
18	0 2.957	0 12.813	0 22.670	0 32.526	0 42.383	0 52.239	1 2.096	1 11.952	18	0.049
19	0 3.121	0 12.978	0 22.834	0 32.691	0 42.547	0 52.404	1 2.260	1 12.117	19	0.052
20	0 3.285	0 13.142	0 22.998	0 32.855	0 42.711	0 52.568	1 2.424	1 12.281	20	0.055
21	0 3.450	0 13.306	0 23.163	0 33.019	0 42.876	0 52.732	1 2.589	1 12.445	21	0.057
22	0 3.614	0 13.471	0 23.327	0 33.183	0 43.040	0 52.896	1 2.753	1 12.609	22	0.060
23	0 3.778	0 13.635	0 23.491	0 33.348	0 43.204	0 53.061	1 2.917	1 12.774	23	0.063
24	0 3.943	0 13.799	0 23.656	0 33.512	0 43.368	0 53.225	1 3.081	1 12.938	24	0.066
25	0 4.107	0 13.963	0 23.820	0 33.676	0 43.533	0 53.389	1 3.246	1 13.102	25	0.068
26	0 4.271	0 14.128	0 23.984	0 33.841	0 43.697	0 53.554	1 3.410	1 13.266	26	0.071
27	0 4.435	0 14.292	0 24.148	0 34.005	0 43.861	0 53.718	1 3.574	1 13.431	27	0.074
28	0 4.600	0 14.456	0 24.313	0 34.169	0 44.026	0 53.882	1 3.739	1 13.595	28	0.077
29	0 4.764	0 14.620	0 24.477	0 34.333	0 44.190	0 54.046	1 3.903	1 13.759	29	0.079
30	0 4.928	0 14.785	0 24.641	0 34.498	0 44.354	0 54.211	1 4.067	1 13.924	30	0.082
31	0 5.093	0 14.949	0 24.805	0 34.662	0 44.518	0 54.375	1 4.231	1 14.088	31	0.085
32	0 5.257	0 15.113	0 24.970	0 34.826	0 44.683	0 54.539	1 4.396	1 14.252	32	0.088
33	0 5.421	0 15.278	0 25.134	0 34.990	0 44.847	0 54.703	1 4.560	1 14.416	33	0.090
34	0 5.585	0 15.442	0 25.298	0 35.155	0 45.011	0 54.868	1 4.724	1 14.581	34	0.093
35	0 5.750	0 15.606	0 25.463	0 35.319	0 45.176	0 55.032	1 4.888	1 14.745	35	0.096
36	0 5.914	0 15.770	0 25.627	0 35.483	0 45.340	0 55.196	1 5.053	1 14.909	36	0.099
37	0 6.078	0 15.935	0 25.791	0 35.648	0 45.504	0 55.361	1 5.217	1 15.073	37	0.101
38	0 6.242	0 16.099	0 25.955	0 35.812	0 45.668	0 55.525	1 5.381	1 15.238	38	0.104
39	0 6.407	0 16.263	0 26.120	0 35.976	0 45.833	0 55.689	1 5.546	1 15.402	39	0.107
40	0 6.571	0 16.427	0 26.284	0 36.140	0 45.997	0 55.853	1 5.710	1 15.566	40	0.110
41	0 6.735	0 16.592	0 26.448	0 36.305	0 46.161	0 56.018	1 5.874	1 15.731	41	0.112
42	0 6.900	0 16.756	0 26.612	0 36.469	0 46.325	0 56.182	1 6.038	1 15.895	42	0 115
43	0 7.064	0 16.920	0 26.777	0 36.633	0 46.490	0 56.346	1 6.203	1 16.059	43	0.118
44	0 7.228	0 17.085	0 26.941	0 36.798	0 46.654	0 56.510	1 6.367	1 16.223	44	0.120
45	0 7.392	0 17.249	0 27.105	0 36.962	0 46.818	0 56.675	1 6.531	1 16.388	45	0.123
46	0 7.557	0 17.413	0 27.270	0 37.126	0 46.983	0 56.839	1 6.695	1 16.552	46	0.126
47	0 7.721	0 17.577	0 27.434	0 37.290	0 47.147	0 57.003	1 6.860	1 16.716	47	0.129
48	0 7.885	0 17.742	0 27.598	0 37.455	0 47.311	0 57.168	1 7.024	1 16.881	48	0.131
49	0 8.049	0 17.906	0 27.762	0 37.619	0 47.475	0 57.332	1 7.188	1 17.045	49	0.134
50	0 8.214	0 18.070	0 27.927	0 37.783	0 47.640	0 57.496	1 7.353	1 17.209	50	0.137
51	0 8.378	0 18.234	0 28.091	0 37.947	0 47.804	0 57.660	1 7.517	1 17.373	51	0.140
52	0 8.542	0 18.399	0 28.255	0 38.112	0 47.968	0 57.825	1 7.681	1 17.538	52	0.142
53	0 8.707	0 18.563	0 28.420	0 38.276	0 48.132	0 57.989	1 7.845	1 17.702	53	0.145
54	0 8.871	0 18.727	0 28.584	0 38.440	0 48.297	0 58.153	1 8.010	1 17.866	54	0.148
55	0 9.035	0 18.892	0 28.748	0 38.605	0 48.461	0 58.317	1 8.174	1 18.030	55	0.151
56	0 9.199	0 19.056	0 28.912	0 38.769	0 48.625	0 58.482	1 8.338	1 18.195	56	0.153
57	0 9.364	0 19.220	0 29.077	0 38.933	0 48.790	0 58.646	1 8.502	1 18.359	57	0.156
58	0 9.528	0 19.384	0 29.241	0 39.097	0 48.954	0 58.810	1 8.667	1 18.523	58	0.159
59	0 9.692	0 19.549	0 29.405	0 39.262	0 49.118	0 58.975	1 8.831	1 18.688	59	0.162
Mean Solar.	$0^{\text{h.}}$	$1^{\text{h.}}$	$2^{\text{h.}}$	$3^{\text{h.}}$	$4^{\text{h.}}$	$5^{\text{h.}}$	$6^{\text{h.}}$	$7^{\text{h.}}$	For Seconds.	

TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	$8^{\text{h.}}$	$9^{\text{h.}}$	$10^{\text{h.}}$	$11^{\text{h.}}$	$12^{\text{h.}}$	$13^{\text{h.}}$	$14^{\text{h.}}$	$15^{\text{h.}}$	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	1 18.852	1 28.708	1 38.565	1 48.421	1 58.278	2 8.134	2 17.991	2 27.847	0	0.000
1	1 19.016	1 28.873	1 38.729	1 48.585	1 58.442	2 8.298	2 18.155	2 28.011	1	0.003
2	1 19.180	1 29.037	1 38.893	1 48.750	1 58.606	2 8.463	2 18.319	2 28.176	2	0.005
3	1 19.345	1 29.201	1 39.058	1 48.914	1 58.771	2 8.627	2 18.483	2 28.340	3	0.008
4	1 19.509	1 29.365	1 39.222	1 49.078	1 58.935	2 8.791	2 18.648	2 28.504	4	0.011
5	1 19.673	1 29.530	1 39.386	1 49.243	1 59.099	2 8.956	2 18.812	2 28.668	5	0.014
6	1 19.837	1 29.694	1 39.550	1 49.407	1 59.263	2 9.120	2 18.976	2 28.833	6	0.016
7	1 20.002	1 29.858	1 39.715	1 49.571	1 59.428	2 9.284	2 19.141	2 28.997	7	0.019
8	1 20.166	1 30.022	1 39.879	1 49.735	1 59.592	2 9.448	2 19.305	2 29.161	8	0.022
9	1 20.330	1 30.187	1 40.043	1 49.900	1 59.756	2 9.613	2 19.469	2 29.326	9	0.025
10	1 20.495	1 30.351	1 40.207	1 50.064	1 59.920	2 9.777	2 19.633	2 29.490	10	0.027
11	1 20.659	1 30.515	1 40.372	1 50.228	2 0.085	2 9.941	2 19.798	2 29.654	11	0.030
12	1 20.823	1 30.680	1 40.536	1 50.393	2 0.249	2 10.105	2 19.962	2 29.818	12	0.033
13	1 20.987	1 30.844	1 40.700	1 50.557	2 0.413	2 10.270	2 20.126	2 29.983	13	0.036
14	1 21.152	1 31.008	1 40.865	1 50.721	2 0.578	2 10.434	2 20.290	2 30.147	14	0.038
15	1 21.316	1 31.172	1 41.029	1 50.885	2 0.742	2 10.598	2 20.455	2 30.311	15	0.041
16	1 21.480	1 31.337	1 41.193	1 51.050	2 0.906	2 10.763	2 20.619	2 30.476	16	0.044
17	1 21.644	1 31.501	1 41.357	1 51.214	2 1.070	2 10.927	2 20.783	2 30.640	17	0.047
18	1 21.809	1 31.665	1 41.522	1 51.378	2 1.235	2 11.091	2 20.948	2 30.804	18	0.049
19	1 21.973	1 31.829	1 41.686	1 51.542	2 1.399	2 11.255	2 21.112	2 30.968	19	0.052
20	1 22.137	1 31.994	1 41.850	1 51.707	2 1.563	2 11.420	2 21.276	2 31.133	20	0.055
21	1 22.302	1 32.158	1 42.015	1 51.871	2 1.727	2 11.584	2 21.440	2 31.297	21	0.057
22	1 22.466	1 32.322	1 42.179	1 52.035	2 1.892	2 11.748	2 21.605	2 31.461	22	0.060
23	1 22.630	1 32.487	1 42.343	1 52.200	2 2.056	2 11.912	2 21.769	2 31.625	23	0.063
24	1 22.794	1 32.651	1 42.507	1 52.364	2 2.220	2 12.077	2 21.933	2 31.790	24	0.066
25	1 22.959	1 32.815	1 42.672	1 52.528	2 2.385	2 12.241	2 22.098	2 31.954	25	0.068
26	1 23.123	1 32.979	1 42.836	1 52.692	2 2.549	2 12.405	2 22.262	2 32.118	26	0.071
27	1 23.287	1 33.144	1 43.000	1 52.857	2 2.713	2 12.570	2 22.426	2 32.283	27	0.074
28	1 23.451	1 33.308	1 43.164	1 53.021	2 2.877	2 12.734	2 22.590	2 32.447	28	0.077
29	1 23.616	1 33.472	1 43.329	1 53.185	2 3.042	2 12.898	2 22.755	2 32.611	29	0.079
30	1 23.780	1 33.637	1 43.493	1 53.349	2 3.206	2 13.062	2 22.919	2 32.775	30	0.082
31	1 23.944	1 33.801	1 43.657	1 53.514	2 3.370	2 13.227	2 23.083	2 32.940	31	0.085
32	1 24.109	1 33.965	1 43.822	1 53.678	2 3.534	2 13.391	2 23.247	2 33.104	32	0.088
33	1 24.273	1 34.129	1 43.986	1 53.842	2 3.699	2 13.555	2 23.412	2 33.268	33	0.090
34	1 24.437	1 34.294	1 44.150	1 54.007	2 3.863	2 13.720	2 23.576	2 33.432	34	0.093
35	1 24.601	1 34.458	1 44.314	1 54.171	2 4.027	2 13.884	2 23.740	2 33.597	35	0.096
36	1 24.766	1 34.622	1 44.479	1 54.335	2 4.192	2 14.048	2 23.905	2 33.761	36	0.099
37	1 24.930	1 34.786	1 44.643	1 54.499	2 4.356	2 14.212	2 24.069	2 33.925	37	0.101
38	1 25.094	1 34.951	1 44.807	1 54.664	2 4.520	2 14.377	2 24.233	2 34.090	38	0.104
39	1 25.259	1 35.115	1 44.971	1 54.828	2 4.684	2 14.541	2 24.397	2 34.254	39	0.107
40	1 25.423	1 35.279	1 45.136	1 54.992	2 4.849	2 14.705	2 24.562	2 34.418	40	0.110
41	1 25.587	1 35.444	1 45.300	1 55.156	2 5.013	2 14.869	2 24.726	2 34.582	41	0.112
42	1 25.751	1 35.608	1 45.464	1 55.321	2 5.177	2 15.034	2 24.890	2 34.747	42	0.115
43	1 25.916	1 35.772	1 45.629	1 55.485	2 5.342	2 15.198	2 25.054	2 34.911	43	0.118
44	1 26.080	1 35.936	1 45.793	1 55.649	2 5.506	2 15.362	2 25.219	2 35.075	44	0.120
45	1 26.244	1 36.101	1 45.957	1 55.814	2 5.670	2 15.527	2 25.383	2 35.239	45	0.123
46	1 26.408	1 36.265	1 46.121	1 55.978	2 5.834	2 15.691	2 25.547	2 35.404	46	0.126
47	1 26.573	1 36.429	1 46.286	1 56.142	2 5.999	2 15.855	2 25.712	2 35.568	47	0.129
48	1 26.737	1 36.593	1 46.450	1 56.306	2 6.163	2 16.019	2 25.876	2 35.732	48	0.131
49	1 26.901	1 36.758	1 46.614	1 56.471	2 6.327	2 16.184	2 26.040	2 35.897	49	0.134
50	1 27.066	1 36.922	1 46.778	1 56.635	2 6.491	2 16.348	2 26.204	2 36.061	50	0.137
51	1 27.230	1 37.086	1 46.943	1 56.799	2 6.656	2 16.512	2 26.369	2 36.225	51	0.140
52	1 27.394	1 37.251	1 47.107	1 56.964	2 6.820	2 16.676	2 26.533	2 36.389	52	0.142
53	1 27.558	1 37.415	1 47.271	1 57.128	2 6.984	2 16.841	2 26.697	2 36.554	53	0.145
54	1 27.723	1 37.579	1 47.436	1 57.292	2 7.149	2 17.005	2 26.861	2 36.718	54	0.148
55	1 27.887	1 37.743	1 47.600	1 57.456	2 7.313	2 17.169	2 27.026	2 36.882	55	0.151
56	1 28.051	1 37.908	1 47.764	1 57.621	2 7.477	2 17.334	2 27.190	2 37.047	56	0.153
57	1 28.215	1 38.072	1 47.928	1 57.785	2 7.641	2 17.498	2 27.354	2 37.211	57	0.156
58	1 28.380	1 38.236	1 48.093	1 57.949	2 7.806	2 17.662	2 27.519	2 37.375	58	0.159
59	1 28.544	1 38.400	1 48.257	1 58.113	2 7.970	2 17.826	2 27.683	2 37.539	59	0.162
Mean Solar.	$8^{\text{h.}}$	$9^{\text{h.}}$	$10^{\text{h.}}$	$11^{\text{h.}}$	$12^{\text{h.}}$	$13^{\text{h.}}$	$14^{\text{h.}}$	$15^{\text{h.}}$	For Seconds.	

TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	$16^{h.}$	$17^{h.}$	$18^{h.}$	$19^{h.}$	$20^{h.}$	$21^{h.}$	$22^{h.}$	$23^{h.}$	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	2 37.704	2 47.560	2 57.417	3 7.273	3 17.129	3 26.986	3 36.842	3 46.699	0	0.000
1	2 37.868	2 47.724	2 57.581	3 7.437	3 17.294	3 27.150	3 37.007	3 46.863	1	0.003
2	2 38.032	2 47.889	2 57.745	3 7.602	3 17.458	3 27.315	3 37.171	3 47.027	2	0.005
3	2 38.196	2 48.053	2 57.909	3 7.766	3 17.622	3 27.479	3 37.335	3 47.192	3	0.008
4	2 38.361	2 48.217	2 58.074	3 7.930	3 17.787	3 27.643	3 37.500	3 47.356	4	0.011
5	2 38.525	2 48.381	2 58.238	3 8.094	3 17.951	3 27.807	3 37.664	3 47.520	5	0.014
6	2 38.689	2 48.546	2 58.402	3 8.259	3 18.115	3 27.972	3 37.828	3 47.685	6	0.016
7	2 38.854	2 48.710	2 58.566	3 8.423	3 18.279	3 28.136	3 37.992	3 47.849	7	0.019
8	2 39.018	2 48.874	2 58.731	3 8.587	3 18.444	3 28.300	3 38.157	3 48.013	8	0.022
9	2 39.182	2 49.039	2 58.895	3 8.751	3 18.608	3 28.464	3 38.321	3 48.177	9	0.025
10	2 39.346	2 49.203	2 59.059	3 8.916	3 18.772	3 28.629	3 38.485	3 48.342	10	0.027
11	2 39.511	2 49.367	2 59.224	3 9.080	3 18.937	3 28.793	3 38.649	3 48.506	11	0.030
12	2 39.675	2 49.531	2 59.388	3 9.244	3 19.101	3 28.957	3 38.814	3 48.670	12	0.033
13	2 39.839	2 49.696	2 59.552	3 9.409	3 19.265	3 29.122	3 38.978	3 48.834	13	0.036
14	2 40.003	2 49.860	2 59.716	3 9.573	3 19.429	3 29.286	3 39.142	3 48.999	14	0.038
15	2 40.168	2 50.024	2 59.881	3 9.737	3 19.594	3 29.450	3 39.307	3 49.163	15	0.041
16	2 40.332	2 50.188	3 0.045	3 9.901	3 19.758	3 29.614	3 39.471	3 49.327	16	0.044
17	2 40.496	2 50.353	3 0.209	3 10.066	3 19.922	3 29.779	3 39.635	3 49.492	17	0.047
18	2 40.661	2 50.517	3 0.373	3 10.230	3 20.086	3 29.943	3 39.799	3 49.656	18	0.049
19	2 40.825	2 50.681	3 0.538	3 10.394	3 20.251	3 30.107	3 39.964	3 49.820	19	0.052
20	2 40.989	2 50.846	3 0.702	3 10.559	3 20.415	3 30.271	3 40.128	3 49.984	20	0.055
21	2 41.153	2 51.010	3 0.866	3 10.723	3 20.579	3 30.436	3 40.292	3 50.149	21	0.057
22	2 41.318	2 51.174	3 1.031	3 10.887	3 20.744	3 30.600	3 40.456	3 50.313	22	0.060
23	2 41.482	2 51.338	3 1.195	3 11.051	3 20.908	3 30.764	3 40.621	3 50.477	23	0.063
24	2 41.646	2 51.503	3 1.359	3 11.216	3 21.072	3 30.929	3 40.785	3 50.642	24	0.066
25	2 41.810	2 51.667	3 1.523	3 11.380	3 21.236	3 31.093	3 40.949	3 50.806	25	0.068
26	2 41.975	2 51.831	3 1.688	3 11.544	3 21.401	3 31.257	3 41.114	3 50.970	26	0.071
27	2 42.139	2 51.995	3 1.852	3 11.708	3 21.565	3 31.421	3 41.278	3 51.134	27	0.074
28	2 42.303	2 52.160	3 2.016	3 11.873	3 21.729	3 31.586	3 41.442	3 51.299	28	0.077
29	2 42.468	2 52.324	3 2.181	3 12.037	3 21.893	3 31.750	3 41.606	3 51.463	29	0.079
30	2 42.632	2 52.488	3 2.345	3 12.201	3 22.058	3 31.914	3 41.771	3 51.627	30	0.082
31	2 42.796	2 52.653	3 2.509	3 12.366	3 22.222	3 32.078	3 41.935	3 51.791	31	0.085
32	2 42.960	2 52.817	3 2.673	3 12.530	3 22.386	3 32.243	3 42.099	3 51.956	32	0.088
33	2 43.125	2 52.981	3 2.838	3 12.694	3 22.551	3 32.407	3 42.264	3 52.120	33	0.090
34	2 43.289	2 53.145	3 3.002	3 12.858	3 22.715	3 32.571	3 42.428	3 52.284	34	0.093
35	2 43.453	2 53.310	3 3.166	3 13.023	3 22.879	3 32.736	3 42.592	3 52.449	35	0.096
36	2 43.617	2 53.474	3 3.330	3 13.187	3 23.043	3 32.900	3 42.756	3 52.613	36	0.099
37	2 43.782	2 53.638	3 3.495	3 13.351	3 23.208	3 33.064	3 42.921	3 52.777	37	0.101
38	2 43.946	2 53.803	3 3.659	3 13.515	3 23.372	3 33.228	3 43.085	3 52.941	38	0.104
39	2 44.110	2 53.967	3 3.823	3 13.680	3 23.536	3 33.393	3 43.249	3 53.106	39	0.107
40	2 44.275	2 54.131	3 3.988	3 13.844	3 23.700	3 33.557	3 43.413	3 53.270	40	0.110
41	2 44.439	2 54.295	3 4.152	3 14.008	3 23.865	3 33.721	3 43.578	3 53.434	41	0.112
42	2 44.603	2 54.460	3 4.316	3 14.173	3 24.029	3 33.886	3 43.742	3 53.598	42	0.115
43	2 44.767	2 54.624	3 4.480	3 14.337	3 24.193	3 34.050	3 43.906	3 53.763	43	0.118
44	2 44.932	2 54.788	3 4.645	3 14.501	3 24.358	3 34.214	3 44.071	3 53.927	44	0.120
45	2 45.096	2 54.952	3 4.809	3 14.665	3 24.522	3 34.378	3 44.235	3 54.091	45	0.123
46	2 45.260	2 55.117	3 4.973	3 14.830	3 24.686	3 34.543	3 44.399	3 54.256	46	0.126
47	2 45.425	2 55.281	3 5.137	3 14.994	3 24.850	3 34.707	3 44.563	3 54.420	47	0.129
48	2 45.589	2 55.445	3 5.302	3 15.158	3 25.015	3 34.871	3 44.728	3 54.584	48	0.131
49	2 45.753	2 55.610	3 5.466	3 15.322	3 25.179	3 35.035	3 44.892	3 54.748	49	0.134
50	2 45.917	2 55.774	3 5.630	3 15.487	3 25.343	3 35.200	3 45.056	3 54.913	50	0.137
51	2 46.082	2 55.938	3 5.795	3 15.651	3 25.508	3 35.364	3 45.220	3 55.077	51	0.140
52	2 46.246	2 56.102	3 5.959	3 15.815	3 25.672	3 35.528	3 45.385	3 55.241	52	0.142
53	2 46.410	2 56.267	3 6.123	3 15.980	3 25.836	3 35.693	3 45.549	3 55.405	53	0.145
54	2 46.574	2 56.431	3 6.287	3 16.144	3 26.000	3 35.857	3 45.713	3 55.570	54	0.148
55	2 46.739	2 56.595	3 6.452	3 16.308	3 26.165	3 36.021	3 45.878	3 55.734	55	0.151
56	2 46.903	2 56.759	3 6.616	3 16.472	3 26.329	3 36.185	3 46.042	3 55.898	56	0.153
57	2 47.067	2 56.924	3 6.780	3 16.637	3 26.493	3 36.350	3 46.206	3 56.063	57	0.156
58	2 47.232	2 57.088	3 6.944	3 16.801	3 26.657	3 36.514	3 46.370	3 56.227	58	0.159
59	2 47.396	2 57.252	3 7.109	3 16.965	3 26.822	3 36.678	3 46.535	3 56.391	59	0.162
Mean Solar.	$16^{h.}$	$17^{h.}$	$18^{h.}$	$19^{h.}$	$20^{h.}$	$21^{h.}$	$22^{h.}$	$23^{h.}$	For Seconds.	

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TABLE IV.—LATITUDE BY POLARIS.

TABLE FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS.

Reduce the observed altitude of Polaris to the true altitude.

Reduce the recorded time of observation to local sidereal time.

If the sidereal time is { **less than 1^{h} $18^{m}.6$, subtract it from 1^{h} $18^{m}.6$;**
between 1^{h} $18^{m}.6$ and 13^{h} $18^{m}.6$, subtract 1^{h} $18^{m}.6$ from it;
greater than 13^{h} $18^{m}.6$, subtract it from 25^{h} $18^{m}.6$;
and the remainder is the hour-angle of Polaris.

With this hour-angle take out the correction from Table IV, and add it to or subtract it from the true altitude, according to its sign. The result is the approximate latitude of the place.

Example.—1890, November 10, at 9^{h} 29^{m} 29^{s}, P. M., mean solar time, in longitude 29° east of Greenwich, suppose the true altitude of Polaris to be 29° 29′: required the latitude of the place.

	h m s
Local astronomical mean time	9 29 29
Reduction from Table III, for 9^{h} 29^{m} 29^{s}	+ 1 34
Greenwich sidereal time of mean noon, November 10, page 183 .	15 18 22.9
Reduction from Table III, for longitude (= 1^{h} 56^{m} east, or minus)	— 0 19
Sum (having regard to signs) is equal to local sidereal time .	0 49 6.9
	h m s 1 18 36.0
Subtract sidereal time	0 49 6.9
Remainder is equal to hour-angle of Polaris	0 29 29.1

True altitude	+ 29° 29′.0
Correction from Table IV. . . .	— 1 16.3
Approximate Latitude . . .	+ 28 12.7

TABLE IV—1890.

Hour-Angle.	0h.		1h.		2h.		3h.		4h.		5h.	
m	° ′	′	° ′	′	° ′	′	° ′	′	° ′	′	° ′	′
0	− 1 17.0	0.0	− 1 14.3	0.5	− 1 6.5	0.9	− 0 54.1	1.2	− 0 37.8	1.5	− 0 19.1	1.6
5	1 17.0	0.1	1 13.8	0.5	1 5.6	0.9	0 52.9	1.3	0 36.3	1.5	0 17.5	1.7
10	1 16.9	0.1	1 13.3	0.5	1 4.7	0.9	0 51.6	1.3	0 34.8	1.5	0 15.8	1.6
15	1 16.8	0.1	1 12.8	0.6	1 3.8	1.0	0 50.3	1.3	0 33.3	1.5	0 14.2	1.7
20	− 1 16.7	0.2	− 1 12.2	0.6	− 1 2.8	1.0	− 0 49.0	1.3	− 0 31.8	1.5	− 0 12.5	1.6
25	1 16.5	0.2	1 11.6	0.6	1 1.8	1.0	0 47.7	1.3	0 30.3	1.5	0 10.9	1.7
30	1 16.3	0.2	1 11.0	0.7	1 0.8	1.1	0 46.4	1.4	0 28.8	1.6	0 9.2	1.6
35	1 16.1	0.3	1 10.3	0.7	0 59.7	1.1	0 45.0	1.4	0 27.2	1.6	0 7.6	1.7
40	− 1 15.8	0.3	− 1 9.6	0.7	− 0 58.6	1.1	− 0 43.6	1.4	− 0 25.6	1.6	− 0 5.9	1.7
45	1 15.5	0.4	1 8.9	0.8	0 57.5	1.1	0 42.2	1.4	0 24.0	1.6	0 4.2	1.7
50	1 15.1	0.4	1 8.1	0.8	0 56.4	1.1	0 40.8	1.5	0 22.4	1.6	0 2.5	1.7
55	1 14.7	0.4	1 7.3	0.8	0 55.3	1.2	0 39.3	1.5	0 20.8	1.7	− 0 0.8	1.7
60	− 1 14.3		− 1 6.5		− 0 54.1		− 0 37.8		− 0 19.1		+ 0 0.9	

Hour-Angle.	6h.		7h.		8h.		9h.		10h.		11h.	
m	° ′	′	° ′	′	° ′	′	° ′	′	° ′	′	° ′	′
0	+ 0 0.9	1.7	+ 0 20.7	1.6	+ 0 39.1	1.4	+ 0 54.9	1.1	+ 1 6.9	0.8	+ 1 14.4	0.4
5	0 2.6	1.7	0 22.3	1.6	0 40.5	1.4	0 56.0	1.1	1 7.7	0.8	1 14.8	0.4
10	0 4.3	1.7	0 23.9	1.6	0 41.9	1.4	0 57.1	1.1	1 8.5	0.7	1 15.2	0.4
15	0 6.0	1.6	0 25.5	1.6	0 43.3	1.4	0 58.2	1.1	1 9.2	0.7	1 15.6	0.3
20	+ 0 7.6	1.7	+ 0 27.1	1.6	+ 0 44.7	1.4	+ 0 59.3	1.1	+ 1 9.9	0.7	+ 1 15.9	0.3
25	0 9.3	1.7	0 28.7	1.6	0 46.1	1.3	1 0.4	1.0	1 10.6	0.6	1 16.2	0.2
30	0 11.0	1.6	0 30.3	1.5	0 47.4	1.3	1 1.4	1.0	1 11.2	0.6	1 16.4	0.2
35	0 12.6	1.6	0 31.8	1.5	0 48.7	1.3	1 2.4	1.0	1 11.8	0.6	1 16.6	0.1
40	+ 0 14.2	1.7	+ 0 33.3	1.5	+ 0 50.0	1.3	+ 1 3.4	0.9	+ 1 12.4	0.5	+ 1 16.7	0.1
45	0 15.9	1.6	0 34.8	1.5	0 51.3	1.2	1 4.3	0.9	1 12.9	0.5	1 16.8	0.1
50	0 17.5	1.6	0 36.3	1.4	0 52.5	1.2	1 5.2	0.9	1 13.4	0.5	1 16.9	0.1
55	0 19.1	1.6	0 37.7	1.4	0 53.7	1.2	1 6.1	0.8	1 13.9	0.5	1 17.0	0.0
60	+ 0 20.7		+ 0 39.1		+ 0 54.9		+ 1 6.9		+ 1 14.4		+ 1 17.0	